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FOREST TREES
of
OKLAHOMA

How to Know Them

Issued by

OKLAHOMA FOREST SERVICE
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State Capitol,
Oklahoma City, Oklahoma

OKLAHOMA AGRICULTURAL AND MECHANICAL COLLEGE
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GENERAL PRINTING CO., OKLAHOMA CITY

FOREST TREES
of
OKLAHOMA

How to Know Them

A Pocket Manual

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FOREWORD

This handbook has been prepared in response to a growing demand for information regarding our common forest trees. These requests are largely the result of a widening appreciation of the possibilities of tree planting as a means of producing a marketable commodity of increasing value that will add yearly to the farm income as well as enhance the value of the farm, both as salable property and as a comfortable and attractive home.

Oklahoma has many trees producing useful and valuable wood and others that may be successfully planted. Timber is the best crop to grow on certain soils and locations on the farm. Many farmers have, for example, some hillsides or worn out gullied sandy or wet lands better adapted for growing timber than any other crop. To rightly utilize all the farm is a sign of good farm management.

It is natural for young people to be interested in trees. Many will become farm owners of the future, and a knowledge of trees will add an interest in their lives and prove to be a very material asset. School teachers, county agents, scout leaders, etc., who deal with both present and future owners of timberland, will be aided by this manual in acquiring a better knowledge of the uses and value of our forest trees.

Altogether ninety-three trees are described and illustrated, with a brief description or mention of sixty-nine other varieties or species, all of which are native or very extensively planted in the State.

Grateful acknowledgment is hereby made to the State Forestry Departments of Maryland, Virginia, North Carolina and Tennessee and to the Botanical Departments of the Colleges of Agriculture of Arkansas and Mississippi for the use of portions of the text. All of the cuts of the hardwoods are from original drawings by Mrs. E. A. Hoyle of the United States Forest Service, while those of the conifers are from Sargent's "Manual of the Trees of North America," by permission of Houghton-Mifflin Company.

The rapidly increasing interest in outdoor life, stimulated by good roads, the automobile, the boys' and girls' clubs and scout movements, and the widened outlook resulting from the spread of education, encourages the rational treatment of our trees and forests. It is highly important that this be done in order that our forests may continue to furnish the material so essential to the maintenance of the industrial and social life of the State and Nation, to protect our farmsteads and mountain streams, and to provide places of pleasure and recreation for our people.

THE OKLAHOMA FOREST COMMISSION

MEMBERS

Mr. Harry B. Cordell, President, State Board of Agriculture, Oklahoma City, Chairman.
Dr. Henry G. Bennett, President, Oklahoma A. and M. College, Stillwater.
Mr. John F. Easley, Ardmore. Mr. John M. Craig, Idabel.
Mrs. V. B. Gorman, Muskogee.

SECRETARY AND STATE FORESTER
George R. Phillips, State Capitol, Oklahoma City, Oklahoma.

The Oklahoma Forest Commission is composed of the President of the State Board of Agriculture, who is ex-officio chairman; the President of the Oklahoma A. and M. College; a representative of the State Federation of Women's Clubs, appointed by the Governor from a list of five names submitted to him by the Executive Board of the Federation of Clubs, and two members appointed by the Governor.

The Commission employs a technically trained forester to act as its Secretary and State Forester.

Headquarters of the Commission are in the offices of the State Board of Agriculture at the State Capitol, Oklahoma City, Okla.

The efforts of the Forest Commission have been directed along several lines of endeavor. In coöperation with the U. S. Forest Service and private land owners, fire protection has been established on 1,312,000 acres in southeastern Oklahoma. By this means and by exercise of proper cutting methods it is hoped to keep this portion of the State forever producing a profitable crop of trees.

In coöperation with the U. S. Forest Service a forest nursery has been established on the grounds of the A. and M. College at Stillwater on land donated by the College. There is being grown in and distributed from this nursery forest planting stock suitable for woodlot and windbreak planting on the farms of the State. Trees are available only for the above purposes and are sold at a nominal price. Address inquiries to the State Forester, Oklahoma City.

An educational campaign encouraging the planting of trees about homes, public buildings, school houses, along highways and for woodlot and windbreak purposes is being conducted. It is in connection with this work and with the idea of making Oklahomans generally acquainted with the forests and trees we already have that publication of this booklet was deemed advisable.

WHAT IS FORESTRY?

Forestry, in brief, may be defined as the art and science of forming, caring for or cultivating forests.

Were it defined as applied to the great State of Oklahoma as a whole it would necessitate a much more elaborate and involved definition than this.

Proper application of forestry principles in management of woodlands for profitable production of forest products may be likened to a bank and its operation. The ground upon which forests grow may be compared to the building in which the banking institution is housed. The growing stock, or forest growth on the land, represents money deposited in the bank as a savings account. The larger the savings account, hence the larger the growing stock of trees, the greater will be the returns.

The savings account or growing stock is deposited for the return, the interest, which it will accumulate. The annual growth or increment of the trees is the interest. This may be cut off each year in the form of posts, poles, fuel and lumber without in any way diminishing the capital stock or savings account.

Certain factors favorable to proper management of the land and growing stock so that a maximum return may be netted are proper cutting policies, careful logging methods, removal of undesirable trees and species from the stand, and protection from fire. Elimination of livestock grazing, particularly in hardwood forests, is an equally important factor. It is the practical application of these and other factors to increase forest land yields which make up applied forestry.

Planting of trees in the form of windbreaks and farm woodlands, for the protection of buildings, livestock and orchards and for the forest products such as posts, poles, fuel and lumber they will produce is equally a form of applied forestry. These artificial forests often play additional important roles, such as preventing soil from eroding and holding stream banks from caving in.

FOREST CONDITIONS IN OKLAHOMA

Oklahoma, a great area of 44,424,960 acres, with her southern corner only about 350 feet and her northwestern corner 4979 feet above sea level, with an annual precipitation of 50 inches in her eastern section, dwindling to but little over 15 inches in her northwestern portion, presents a wonderfully varied set of conditions to those interested in her forests and in tree planting.

The native forests range from the bottomland hardwoods and shortleaf pine—oak types of the extreme southeast, through the hardwood type of the Ozarks, the black-jack oak—post oak type, on through the prairies where the only native trees occur along streams and in canyons, to the foothill type of the Rockies where pinon pine and scrubby oaks form the major portion of the ground cover.

Originally Oklahoma had over 12,000,000 acres, or 27 per cent of her total area, covered with forests. Today approximately 12,000,000 acres are still classed as forest land. Part is still virgin forest, part has been cut over and part has been cleared and abandoned. The shortleaf pine-oak type, the most important commercial type, covers about 4,000,000 acres, the other 8,000,000 acres being popularly known as black-jack oak--post oak land.

Oklahoma has need of all the trees she now possesses and of many others in addition. Practically all of the present forested area is so rough, topographically, and has such infertile soil that it will be impossible of cultivation for annual crops or will, at best, be sub-marginal from an agricultural standpoint. This means that it should always be kept at work producing the only crop it is capable of growing—trees. Protection from forest fires is an absolute essential if this is to be carried out.

Forests can be made to perpetuate themselves only if the young trees are allowed to grow up and replace the old ones that die or are cut for commercial purposes. Fires kill these little trees and damage the older ones.

Rough, hilly land can best be kept from eroding if covered with forest growth. The roots in the ground and the leaves, twigs and humus on top of the ground hold the soil in place. Fire destroys this mulch, allowing stormwaters to rush off rapidly and wash away the soil.

Trees and shrubs in the forest form protective cover and their fruits form a source of food supply for game animals and birds. Fires destroy these little trees and shrubs with their attendant benefits, thus forcing the game out of the country.

A practical cutting plan should be followed to keep the forests at their highest possible production point. Already our largest lumber company has adopted a policy whereby they do not plan to cut pines below a diameter of twelve inches, which would assure development of an adequate growing stock on the ground at all times. Owners of smaller blocks of forest—farmers and lumbermen—should fall in line with this or a similar plan.

Western Oklahoma, where little natural tree growth occurs, particularly needs trees. Windbreaks about buildings, feeding lots and orchards should be established. Belts of trees along fields for protection from hot winds should be planted. Woodlots on waste land and on land liable to erode, especially along stream banks, would provide post and fuel supplies and prevent much loss of fertile surface soil. Shade trees planted about homes, public buildings, school houses and along highways would all help to make the region more attractive and comfortable.

Trees will grow in western Oklahoma. Widely scattered plantings, mostly of black locust and Russian mulberry, testify to this fact to varying degrees. Of especial value are the plantings on the grounds of the Woodward Field Station of the U. S. Bureau of Plant Industry, where, over a period of fifteen years, many species of shrubs and trees have been planted. Of particular interest because of successful growth are Scotch pine, western yellow pine and Chinese arbor vitae among the evergreens and Chinese elm, American elm, honey locust, sycamore, silver maple, Russian olive, cottonwood, osage orange, hackberry and green ash among the deciduous species.

TREES OF OKLAHOMA

Oklahoma has at least 131 species of native trees contained in 61 genera and 35 families. This is a greater number than is native to all Europe, even though Oklahoma is commonly known as a prairie State. Many species have been introduced for shade or ornamental purposes and nine of the more common or interesting of these are described or listed here.

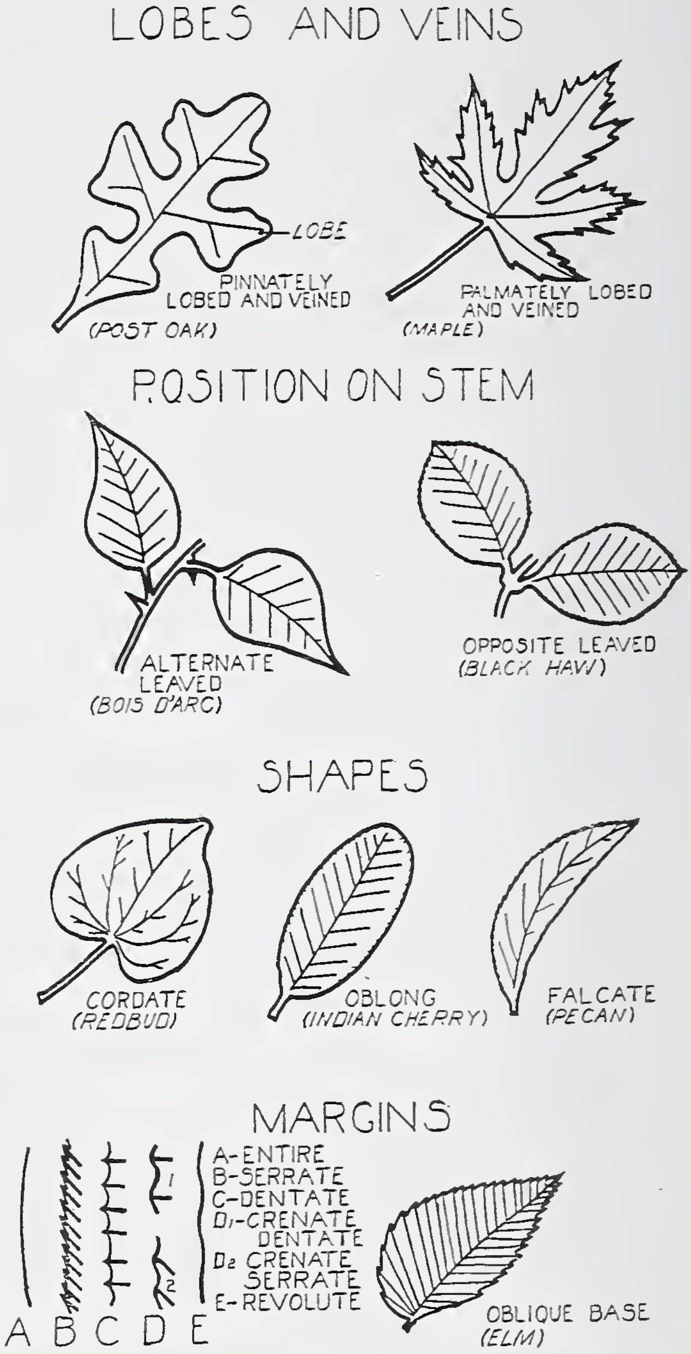
Trees tend to vary within the same species, probably due to differences in soil, exposure, available water or other factors that influence growth. Leaves may vary in shape from the top to the bottom of the same tree. In other cases, the differences may be more marked and more constant. Such trees are called varieties. Thirty varieties of our native trees are mentioned here.

Some species or varieties seem to mix considerably, producing hybrid trees that are difficult to identify. Oaks are particularly apt to do this, and several of their hybrids are recognized, but no attempt has been made to list them in this publication.

Trees, shrubs and vines are all woody plants. There is no distinct line that separates one from the other, but Sudworth, in making his check list, decided that a tree should attain a diameter of two inches and a height of eight feet, in addition to being an erect, woody, perennial. This classification leads us to include such plants as the bladder nut, sumac, old man's beard and button bush. Their tree status may be questioned by some authors, but their wide distribution, or peculiar interest, makes it seem desirable to include them. Shrubs do not attain a two-inch diameter or a height of eight feet; and vines are not normally erect.

Some people know trees by sight or general appearance because they have lived close to them for a long time and have come to recognize, consciously or unconsciously, the many points that make trees different. One may know or feel that a maple is different from an oak, but this manual attempts to show why this is so, in order that the beginner may acquire tree knowledge rapidly and systematically. Careful observation of trees with frequent use of the illustrated pages and the key found later in this book will develop such knowledge. Books, however, merely aid us in our desire to learn. Needless to say, some trees will be easier to identify than others.

One of the easiest and most certain ways of identifying trees is by their leaves. The key is designed for this purpose, making use of the great variety of shapes we find in the leaves of different native, and a few introduced, trees of Oklahoma. Some of the leaves are simple, like those of the oak and cottonwood, and some are intricately fashioned and may be compound. Some of their edges are smooth, some of them are sharply toothed, and some are wavy. The key deals chiefly with these various leaf characteristics, but makes frequent reference to some others that exist during part or all of the year. Once known, many of these trees are easily

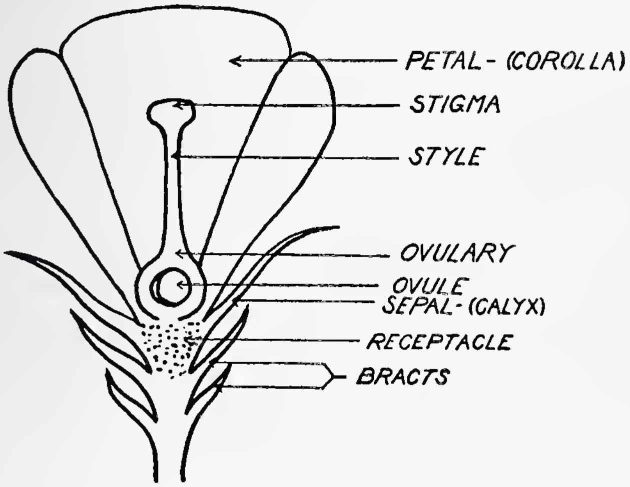


VARIOUS LOBES, VEINS, SHAPES, MARGINS AND POSITIONS ON STEMS OF LEAVES recognized during the winter when no leaves exist. In fact, some of them are most easily recognized at that time of the year. Their habit of branching, whether it be vertical, horizontal, drooping, opposite or alternate is easily studied. The shape and color of the buds are readily seen.

One or two points of distinction often serve to separate one kind of tree from all others in the State and a more detailed examination of such a tree is not necessary. The thin paper-like layers of bark on the birch serve this purpose. A combination of compound leaves and chambered pith is peculiar to the black walnut. Opposite, palmately compound leaves with five to seven leaflets is sufficient description for the buckeye. Large trees with opposite branches will probably be ash or maple.

Flowers may be used to identify trees, but they are short lived, sometimes difficult to obtain, and often very small. Some, however, are very distinctive and open at regular periods each year. The fragrant blossoms of one shrubby witch hazel may be found long before the snow and ice have left the canyons. The white flowers of the shad bush make this tree very evident in early spring. Later, the plum and redbud blossoms appear, and when they have faded or fallen, the dogwood and black haw brighten the woods. Other flowers may be less conspicuous. Some appear along stout branches and are decidedly lacking in the grace we usually associate with flowers. Trees of tropical families are notable in this regard, and those we encounter here may be considered wanderers from the south. Honey locust is such a tree.

Some knowledge of flower structure is necessary because certain parts of the flower will develop or disappear, making very characteristic fruits.



THE PARTS OF A FLOWER

Berries, nuts, pods and other fruits that result from the development of these flowers give us valuable information.

FRUITS OF TREES

The fruits of our trees are interesting in many ways and often aid us in positively identifying certain trees. Unfortunately, there is no general agreement among botanists as to the exact meaning of certain terms applied to these fruits. This is brought about by the great variety of ways in which fruits are formed, and by the obscure origin of some of the mature parts. An attempt will be made to explain terms applied to our Oklahoma trees.

A FRUIT is a ripened ovulary and its contents, although in certain cases, the calyx, receptacle, or even the bracts become part of it. The seed itself is merely the ripened ovule.

The conifers (pine, cedar and cypress in Oklahoma) should be considered separately because their seed is naked. It is said to be naked because it has never had an ovulary covering. The winged fruit of the pine may not be unlike the winged fruit of the ash in appearance, but the pine wing develops from the seed coat, while the wing of the ash is a modification of the ovulary wall, the true seed coat of the ash being a thin skin covering the seed.

The fleshy fruit of the red cedar is said to be naked because there has been no style, stigma or ovulary there. The fleshy covering has developed from small scales that have turned pulpy, instead of woody as in the pine cone.

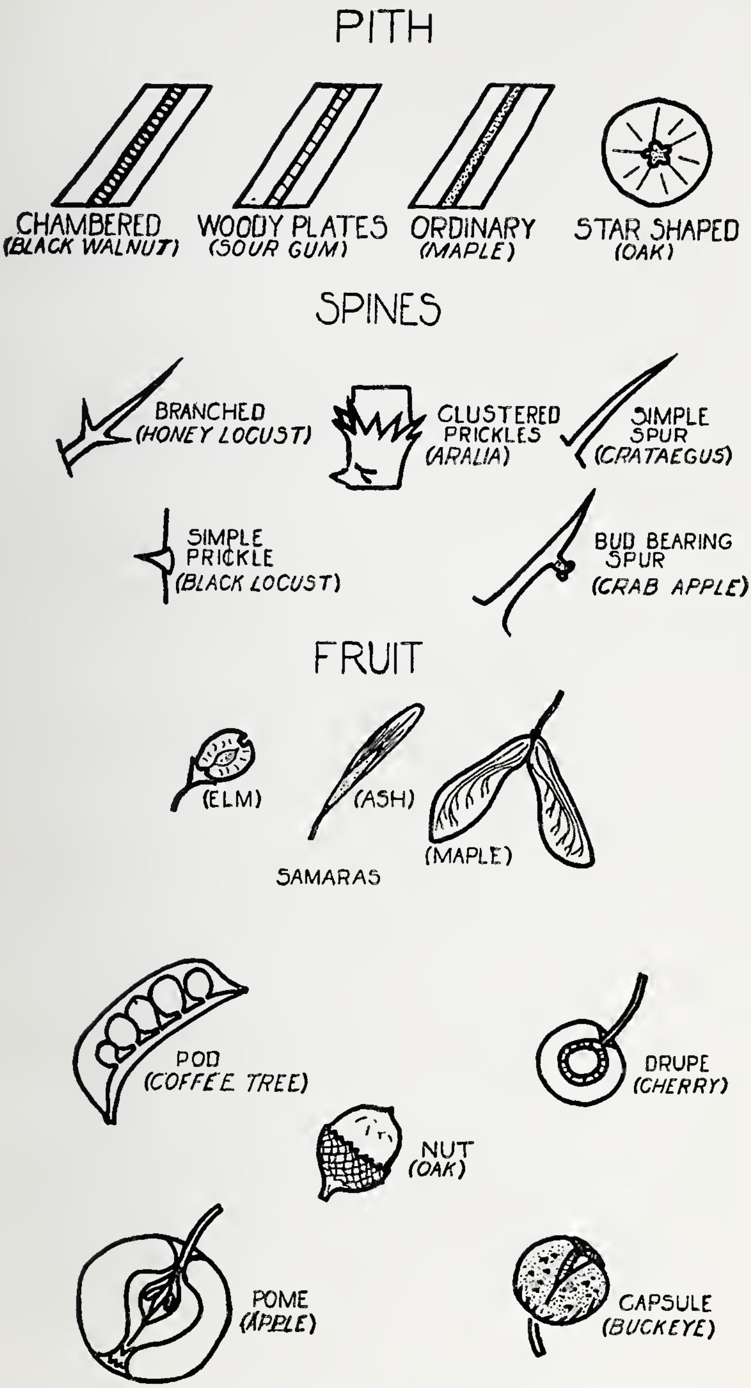
Fruits may be divided into dry and fleshy fruits, although the distinction will not always be clear.

Dry fruits, in turn, may be divided into several general groups, most of which will be familiar. One of the most common is the capsule.

A CAPSULE is usually many seeded and splits along definite lines when ripe. It has developed from a compound ovulary and has two or more carpels which compose the husk or capsule. The fruit of the buckeye, Princess tree, catalpa, cottonwood, sweet gum, witch hazel, bladdernut and willow are examples.

A NUT is a one-celled and one-seeded fruit that usually develops from a compound ovulary, but does not split open when ripe. Or, it may be called a one-seeded capsule that has developed but one of its several ovules and has found it unnecessary to liberate this seed by splitting the capsule wall. The fruit of the oak, beech, chinquapin, blue beech and hickory are examples. In all of these cases, with the possible exception of the hickory, the cups, burrs, wings or husks are developments of the involucre which is usually a collection of bracts below the flower parts.

A SAMARA may be a nut or achene or any other indehiscent (not splitting) fruit with a wing. Such familiar fruits as those of the elm, maple, ash and ailanthus belong here.



VARIOUS KINDS OF PITH, SPINES AND FRUIT

PODS and FOLLICLES are fruits that split along the top or bottom sides or both. Unlike the seeds in the capsule, all those in the pod or follicle are attached in a single row, and the fruit develops from a single ovulary. Mesquite, redbud, black and honey locust and coffee tree have fruits of this kind.

An ACHENE is a small, dry, indehiscent, one-celled, free seed. The fruit of the sycamore is a head of achenes, and that of the mulberry might belong in this class, too, although the fleshy calyx inclosing the seed makes it appear drupaceous. The small free seeds on the strawberry are achenes, while the fleshy portion is an enlarged receptacle.

The fleshy fruits are also broken into several general groups. One of the most common is the drupe.

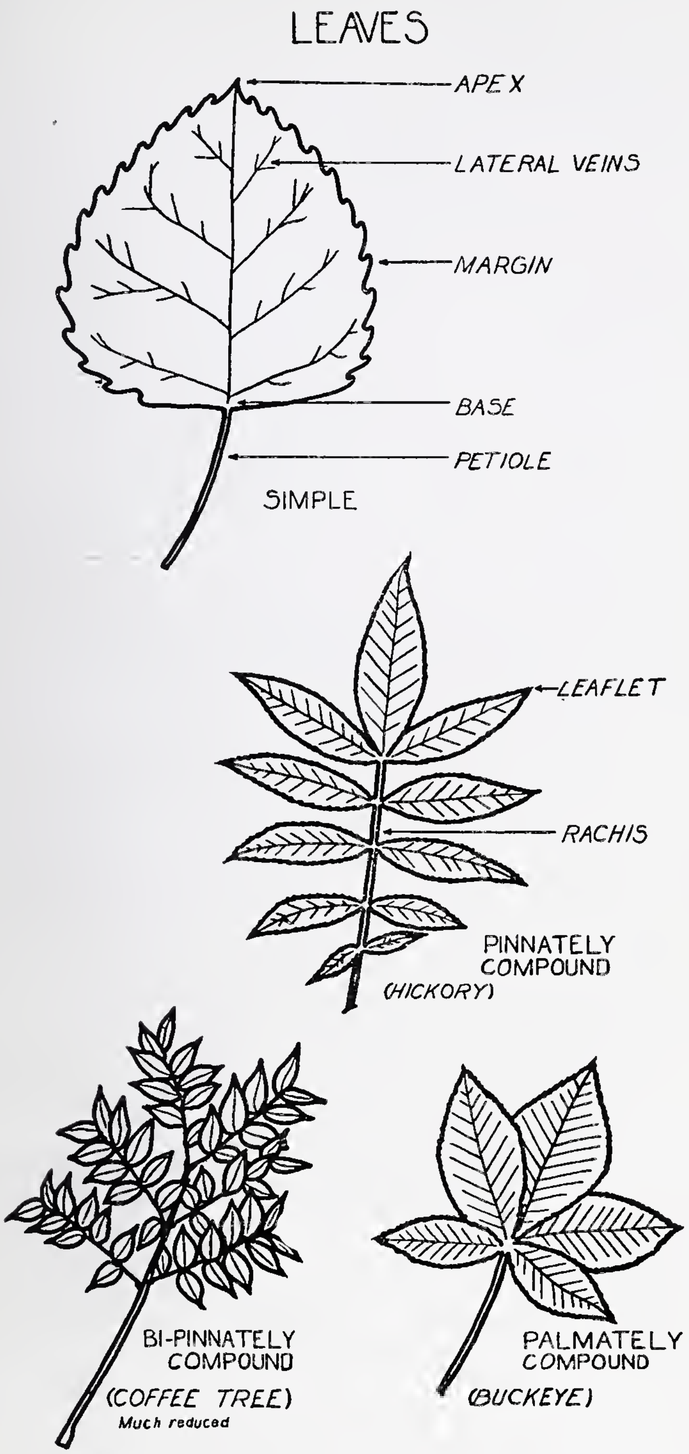
A DRUPE is a fleshy fruit, like that of the plum or walnut, whose central portion forms a stony covering around the seed. There is little to distinguish a drupe from a berry when the fruit is small and several bony seeds are presented. Common drupes are those of the cherry, plum, walnut, hackberry, holly, sour gum, aralia, bois d'Arc, hawthorn and dogwood. The dogwood has a compound drupe, the hawthorn a drupaceous pome and the bois d'Arc a head of many drupes.

A BERRY is a fleshy fruit like the tomato, usually having several or many seeds. The seeds may have hard coats or soft, but no part of the fruit is stony as it is in the drupe. The huckleberry, sassafras and persimmon have berries.

A POME develops in a manner quite different from that of other fruits. The fleshy portion is an enlarged receptacle. The carpels are two or more in number, and are sometimes cartilaginous as in the case of the apple, or bony, as in the fruit of the hawthorn. In the latter case, the fruit becomes drupaceous.

An ARIL is a growth from the extremity of the seed stalk or placenta, but may resemble modified bracts or sepals. The pawpaw and wahoo have fruits with arils, one pulpy and the other dry.

The following key is said to be dichotomous because a tree must fall in one of two classes. If the first brief description, like "leaves simple" fails to classify its leaf it must necessarily be classified as compound. Further subdivisions are made in a like manner. Whenever possible, additional notes have been added in parenthesis to make identification more certain, and outside references less necessary.



SIMPLE AND VARIOUSLY COMPOUND LEAVES

SUMMER KEY TO THE GENERA OF OKLAHOMA TREES

Based Primarily on Leaves and Fruit

1. Leaves needle-like, scale-like or awl-shaped........**Gymnosperms**

 2. Leaves alternate on the stem or in fascicles; fruit a cone.

  3. Leaves persistent (in fascicles of two to five)........Pinus (Pines)

  3. Leaves and branchlets deciduous (alternate)........Taxodium (Cypress)

 2. Leaves opposite or whorled, scale-like or awl-shaped; fruit berry-like with 1 to 4 seeds........Juniperus (Cedars)

1. Leaves broad (net veined)........**Angiosperms**

 2. Leaves opposite

  3. Leaves simple.

   4. Leaves palmately lobed........Acer (Maple)

   4. Leaves without lobes.

    5. Leaf margins serrate.

     6. Buds and sometimes midrib rusty tomentose........Viburnum (Black haw)

     6. Not as above.

      7. Leaves serrate above the middle, teeth incurved; fruit blue-purple, ripening and falling in early summer........Forestiera (Swamp privet)

      7. Leaves serrate the full length of margin; fruit ripening in fall, with scarlet aril........Evonymous (Wahoo)

    5. Leaf margins entire.

     6. Leaves 10 to 12 inches in length.

      7. Leaves usually in whorls of 3, tip tapering; fruit a long capsule........Catalpa

      7. Leaves strictly opposite, tip rounded; fruit an ovate capsule; (pith chambered)........Paulownia (Princess tree)

     6. Leaves less than 7 inches in length.

      7. Leaves with lateral veins curving toward the apex; petiole grooved; fruit red or white........Cornus (Dogwood)

      7. Leaves and fruit not as above.

       8. Leaves often in whorls of 3 (fruit in ball-like heads; usually found at water's edge)........Cephalanthus (Buttonbush)

       8. Leaves strictly opposite (coarsely net veined below; white flowers in clusters of 3)........Chionanthus (Old man's beard)

  3. Leaves compound.

   4. Leaves palmately compound (5 to 7 leaflets)........Aesculus (Buckeye)

   4. Leaves pinnately compound.

    5. Leaves with 3 leaflets.

     6. Leaves finely serrate; fruit bladder-like........Staphylea (Bladdernut)

     6. Leaves coarsely serrate or lobed; fruit 2 samaras joined........Acer negundo (Box elder)

    5. Leaves with more than 3 leaflets.

     6. Leaflets 3 to 5, lobed or coarsely serrate; fruit 2 samaras joined........Acer negundo (Box elder)

     6. Leaflets 5 to 11, margins entire or finely serrate; fruit a free samara........Fraxinus (Ash)

 2. Leaves alternate.

  3. Leaves simple. (If not, see page 15.)

   4. Leaves lobed.

    5. Leaves pinnately lobed, or not distinctly palmately lobed except sometimes in Morus and Sassafras.

     6. Sap in leaves and bark distinctly milky; leaves with 3 distinct veins from base........Morus (Mulberry)

     6. Not as above.

      7. Wood, bark and crushed leaves spicy aromatic; (leaves with 2 or 3 or no lobes)........Sassafras (Sassafras)

      7. Not as above.

       8. Thorns present; fruit fleshy.

9. Thorns usually with lateral buds; fruit an apple........Malus (Crab apple)

9. Thorns without lateral buds; fruit with stony carpels........Crataegus (Hawthorn)

8. Thorns absent; fruit an acorn; (buds clustered at ends of twigs; pith star-shaped)........Quercus (Oak)

9. Leaf lobes bristle tipped (individual leaves often entire); bark dark; wood pores open........Black oaks

9. Leaf lobes entire or gland tipped; bark grey; wood pores closed with tyloses........White oaks

5. Leaves palmately lobed.

6. Leaves star-shaped, lobes finely serrate........Liquidambar (Sweet gum)

6. Leaves broadly ovate, lobes not finely serrate; (buds inclosed by the base of the petiole; outer bark of upper branches and young trunks scaling off leaving smooth white bark)........Platanus (Sycamore)

4. Leaves not lobed.

5. Leaf margins entire.

6. Leaves persistent, (at least during part of winter).

7. Leaves aromatic, under side with yellow resin dots........Myrica (Wax myrtle)

7. Leaves not aromatic or resin dotted, (margins more or less revolute; bark reddish)........Vaccinium (Tree huckleberry)

6. Leaves deciduous.

7. Sap in leaves and bark milky; (spines usually present; fruit orange-like)........Toxylon (Bois d-Arc)

7. Sap in leaves and bark not milky, or at least not conspicuously so.

8. Wood, bark and crushed leaves spicy aromatic, leaves often 2 or 3 lobed; fruit a blue berry with a persistent scarlet calyx........Sassafras

8. Not as above.

9. Leaves distinctly cordate........Cercis (Redbud)

9. Leaves not distinctly cordate.

10. Stipules and stipule scars encircling the twig........Magnolia (Cucumber tree)

10. Stipules and stipule scars (if present) not encircling twig.

11. Leaves 3-veined from base; fruit a small orange or yellow drupe; bark warty; (pith often chambered)........Celtis miss. (Hackberry)

11. Leaves not 3-veined from base; fruit various; bark not warty.

12. Buds in clusters at end of twig; (fruit an acorn; pith star-shaped)..Quercus sp. (Oaks)

12. Buds at end of twig single.

13. Pith partitioned by woody plates.

14. Leaves often 10 to 12 inches in length, (disagreeable odor when crushed)........Asimina (Paw paw)

14. Leaves less than 6 inches in length, (crowded at ends of lateral branches)........Nyssa (Sour gum)

13. Pith not partitioned by woody plates.

14. Pith chambered (at least in most branches; leaves oblong ovate; fruit pulpy with few or many flat seeds)........Diospyros (Persimmon)

14. Pith not chambered.

15. Leaves often fascicled on lateral branches; spines present; leaves less than 3 inches in length........Bumelia (Chittamwood)

15. Leaves never fascicled; branches not spinescent; leaves more than 3 inches in length, (brilliantly colored in fall)........Cotinus (Smoke-tree)

5. Leaf margins toothed or serrate.

6. Leaves persistent.

7. Leaves aromatic, resin dotted........Myrica (Wax myrtle)

7. Leaves not as above.

8. Leaves sharp pointed, (spiny toothed, rarely entire)........Ilex opaca (Holly)

8. Leaves rounded at end, (small, glisten)..........Ilex vomitoria (Yaupon)
6. Leaves deciduous.
7. Sap in leaves and bark milky..........Morus (Mulberry)
7. Sap in leaves and bark not milky.
8. Buds clustered at end of twig; pith star-shaped..........Quercus (Oaks)
8. Not as above.
9. Buds with a single hood-like scale..........Salix (Willow)
9. Buds with more than 1 scale.
10. Buds distinctly stalked.
11. Leaves coarsely toothed or with wavy margins; seeds in a 2-celled capsule..........Hamamelis (Witch hazel)
11. Leaves with finely serrate, wavy margins; nutlets in a cone-like structure; (pith 3 angled)..........Alnus (Alder)
10. Buds not distinctly stalked.
11. Leaf blades about as broad as long.
12. Petioles flattened; leaves crenate-serrate, base equal; buds resinous..Populus (Poplar)
12. Petiole not flattened; leaves sharply serrate, bases oblique; buds one-sided; (fruit attached to a leaf-like wing)..........Tilia (Basswood)
11. Leaf blades longer than broad.
12. Leaves obliquely rounded at base.
13. Pith usually chambered; bark with warty ridges; (fruit an ovoid drupe)..........Celtis (Hackberry)
13. Pith not chambered; bark not warty.
14. Buds evident; fruit a samara; leaves usually doubly serrate..........Ulmus (Elms)
14. Buds minute; fruit a drupe inclosed in a withered calyx; leaves crenate-serrate..........Planera (Water elm)
12. Leaves not distinctly oblique at base.
13. Teeth an extension of the primary veins, no teeth between.
14. Bark smooth, grey; 2 triangular nuts in a prickly burr..........Fagus (Beech)
14. Bark ridged; a single nut in a spiny burr..........Castanea (Chinquapin)
13. Teeth not as above.
14. Pith chambered.
15. Fruit an orange, reddish or blue drupe; (bark warty)..........Celtis (Hackberry)
15. Fruit 4-winged; (flowers bell-like)..........Halesia (Silver bell)
14. Pith not chambered.
15. Glands on upper part of petiole (often inconspicuous without magnifying glass; fruit a fleshy drupe)..........Prunus (Plum and cherry)
15. Glands not present on upper part of petiole.
16. Thorns present.
17. Thorns usually with lateral buds, bearing leaves and flowers; fruit an apple..........Malus (Crab apple)
17. Thorns without leaf or flower buds; fruit with stony carpels......Crataegus (Hawthorn)
16. Thorns absent.
17. Leaves on short spur-like branchlets.
18. Bark on young trunks and old branches peeling in thin paper-like layers..........Betula (Birch)
18. Bark never peeling as above.
19. Fruit red or orange, persistent; pedicels ¼ inch in length on short stout spurs; calyx not evident..........Ilex (Deciduous holly)
19. Fruit red or orange; not persistent; pedicels long, slender, not on spurs; calyx evident..........Crataegus (Hawthorn)
17. Leaves not on short spur-like branches.

18. Bark shreddy; (fruit inclosed in bladder-like membranes)............Ostrya (Ironwood)

18. Bark smooth or scaly but not shreddy.

19. Fruit a nut on a leaf-like bract; (bark smooth grey over fluted trunk)............Carpinus (Blue beech)

19. Fruit fleshy.

20. Leaves oblong; obscure, incurved teeth............Rhamnus (Indian cherry)

20. Leaves not oblong, but are serrate.

21. Bark smooth grey or black and grey mottled, except on old trunks............Amelanchier (Shadbush)

3. Leaves compound.

4. Leaves twice or three times pinnate.

5. Pith large, salmon colored, soft; leaflets entire............Gymnocladus (Coffee tree)

5. Not with the above combination.

6. Base of petiole sheathing stem............Aralia (Hercules club)

6. Not as above.

7. Leaflets crenate or serrate, 4 to 7 pairs of pinnae; (pith often pinkish, but hard and small)............Gleditsia (Honey locust)

7. Leaflets entire, 2 or sometimes 4 pinnae; (stipular spines present)............Prosopis (Mesquite)

4. Leaves once pinnate.

5. Leaves with 3 leaflets............Ptelia (Wafer ash)

5. Leaves with more than 3 leaflets.

6. Pith chocolate colored, chambered............Juglans (Walnut)

6. Pith not as above.

7. Buds hidden within or under petiole.

8. Base of petiole hollow, entirely surrounding bud.

9. Leaflets entire, (distinctly alternate)............Cladrastis (Yellow-wood)

9. Leaflets serrate; (sap milky)............Rhus glabra (Smooth sumac)

8. Base of petiole not hollow, although the buds may be hidden beneath it.

9. Branches unarmed.

10. Leaflets serrate or crenate, sometimes twice pinnate............Gleditsia (Honey locust)

10. Leaflets entire.

11. Leaflets oval............Robinia (Black locust)

11. Leaflets acute............Sophora (Coral bean)

9. Branches armed.

10. Spines branched; leaves on the same tree often 2 or 3 times pinnate............Gleditsia (Honey locust)

10. Spines unbranched; leaves never twice pinnate............Robinia (Black locust)

7. Buds not hidden, but in evidence.

8. Leaves and twigs with prickles............Xanthoxylum (Prickly ash)

8. Leaves and twigs without prickles.

9. Basal lobes of leaflets with glands, rank odor to crushed leaves............Ailanthus (Tree of Heaven)

9. Not as above.

10. Rachis winged............Rhus copallina (Winged sumac)

10. Not as above.

11. Leaflets serrate............Hicoria (Hickory)

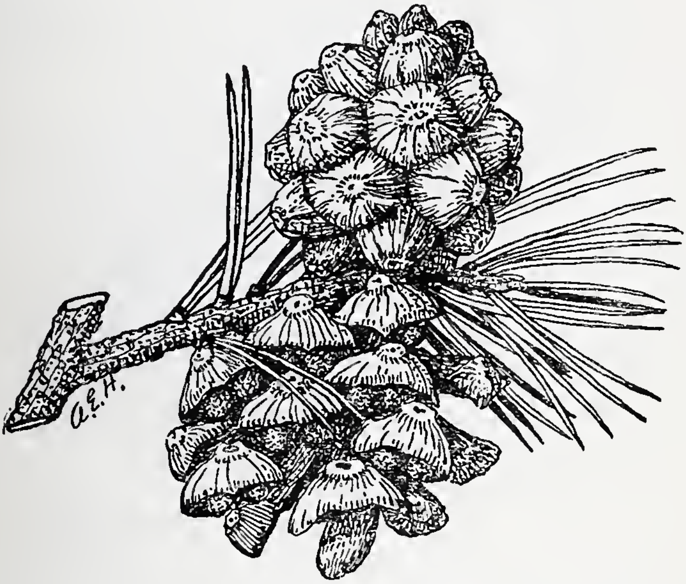
11. Leaflets entire............Sapindus (China tree)

GLOSSARY

Acute—Terminating in a sharp angle.
Alternate—Arranged singly at different heights; not opposite.
Apex—The end of the leaf opposite the petiole.
Aril—An extraneous seed coat or covering.
Aromatic—Fragrant, pleasant odor.
Bark—The cortical covering of a stem.
Base of leaf—Petiole end.
Berry—A fleshy fruit.
Bract—A leaf of the flower axis.
Capsule—A dry fruit of a compound ovulary that opens by a slit or valve.
Calyx—The external, usually green, leaf-like parts of a flower.
Carpel—A simple pistil, or the unit portions of a compound pistil.
Compound—Made up of more than one part.
Cone—A fruit formed of overlapping scales.
Conifer—Cone bearing.
Corolla—The petals of a flower collectively. Usually bright colored and immediately surrounding the seed parts.
Crenate—Rounded teeth.
Cordate—Heart shaped.
Deciduous—Falling. Not evergreen in case of leaves.
Dehiscent—Opening at maturity.
Dentate—Toothed, teeth pointing outward.
Drupe—A fleshy stone fruit like the cherry.
Entire—(Leaf) Margin not notched or toothed.
Family—A group of related genera. A subdivision of the order just as the species is a subdivision of the genus.
Fascicle—A close cluster of leaves or flowers.
Falcate—Scythe-shaped.
Fruit—The ripened ovulary of a seed plant and its contents.
Genus—A group of related species. Intermediate between the family and the species.
Glabrous—Without hairs.
Hybrid—The offspring of two different varieties, species or genera.
Indehiscent—Remaining closed at maturity.
Leaf—Green, food manufacturing expansions on the stem.
Leaflet—Part of a compound leaf.
Lobe—(Leaf) Projection or division of a leaf.
Nut—A hard one-celled, one-seeded fruit that doesn't split open when ripe.
Oblong—Longer than broad with nearly parallel sides.
Oblique—(Leaves) Unequal sided.
Ovulary—Basal portion of the pistil containing the ovule or ovules.
Ovule—An immature seed.
Palmate—Lobed or divided from the petiole; hand-like.
Perennial—Continuing for more than two years.
Persistent—Remaining on. Evergreen in case of leaves.
Petal—A division, or leaf of the corolla.
Petiole—Footstalk of a leaf.
Pinnate—Having leaflets or primary divisions arranged along a common petiole or rachis.
Pith—The central part of a stem.
Placenta—Part of ovulary where seed or seeds are attached.
Pome—A fruit with two or more carpels in fleshy receptacle.
Porous—With open tubes (through wood).
Rachis—The axis of a compound leaf.
Receptacle—The part of a stem that holds the flower.
Revolute—Rolling, or wavy.
Samara—An indehiscent winged fruit.
Seed—A fertilized and mature ovule.
Sepal—A division or leaf of the calyx.
Serrate—Sharp teeth pointing forward.
Shrub—A small woody perennial under two inches in diameter and eight feet in height.
Species—A group of plants (or animals) that have in common one or more distinctive characters.
Stigma—The part of the pistil that received the pollen grains.
Stipule—An appendage of a leaf placed at one side of the petiole at its junction with the stem.
Style—The extension of the ovulary bearing the stigma.
Terminal—End.
Tomentose—Covered with matted hairs.
Tree—A woody perennial over two inches in diameter and eight feet in height.
Tyloses—Obstructions in the wood pores.
Whorl—An arrangement of branches or leaves in a circle around an axis.

PINON (NUT PINE)
(*Pinus edulis* Engelm.)

The nut pine, or pinon, is found in the western part of Cimarron County. The tree forms open forests over great areas from Colorado south and west into Mexico. It is a small tree found locally on warm slopes or in sheltered locations, and forms a bushy top with orange-colored branchlets.



PINON (NUT PINE)
(Pinus edulis Engelm.)

The LEAVES occur in clusters of two leaves each (rarely 3), and are stiff, stout, curved, dark green in color, and about an inch in length. Each year's crop remains on the tree from 5 to 8 years.

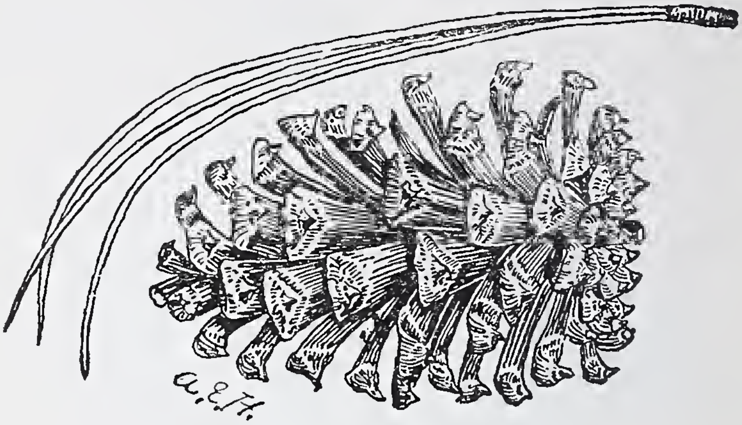
Like all the pines, it has male and female flowers separate on the same tree. The CONE, or burr, is rounded, about 1 to 2 inches across, and produces large seeds or "nuts" from one-half to three-fourths inch long. The latter are rich in food values and formed an important article of diet for the Indians. They are gathered and sold widely as a fancy "nut" in many larger towns and cities.

The WOOD is light, soft, close-grained, and pale brown, used for fuel and sometimes as fencing.

WESTERN YELLOW PINE

(*Pinus ponderosa* Laws.)

The most important commercial pine in the Southwest and parts of the Pacific Northwest is the western yellow pine. It is a large and valuable lumber tree. Its range extends into the extreme western end of Cimarron County, where perhaps a thousand trees still grow.



WESTERN YELLOW PINE
One-half natural size

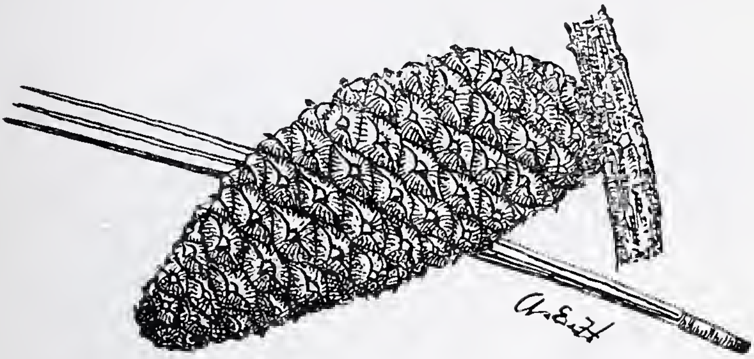
The LEAVES are mostly 5 to 8 inches long and three in a cluster. The clusters are considerably massed toward the ends of naked branches and they remain on the tree for about three years. The tree tops are broad and rounded.

The cones, or FRUIT, are on short stems, reddish brown, oval in shape, and the scales are armed with stout recurved prickles.

The WOOD of this tree as found extensively in the Rocky and Coastal Mountains of the West is of excellent quality, surprisingly uniform in texture for a tree of the yellow pine group. The better grades are often classed on the market with white pine lumber. The wood is hard, strong, rather fine grained and light reddish white, surrounded by a thick band of nearly white sap wood.

LOBLOLLY PINE *(Pinus taeda* L.)

A fast-growing member of the yellow pine group, loblolly pine is found only in the southeastern part of the State and there only to a very limited extent. It is variously known locally as shortleaf pine, yellow pine and old-field pine. As the last name implies, it seeds up abandoned fields rapidly, particularly in sandy soils where the water is close to the surface. It is also frequent in clumps along the borders of swamps and as scattered specimens in the swamp hardwood forests.



LOBLOLLY PINE
One-half natural size

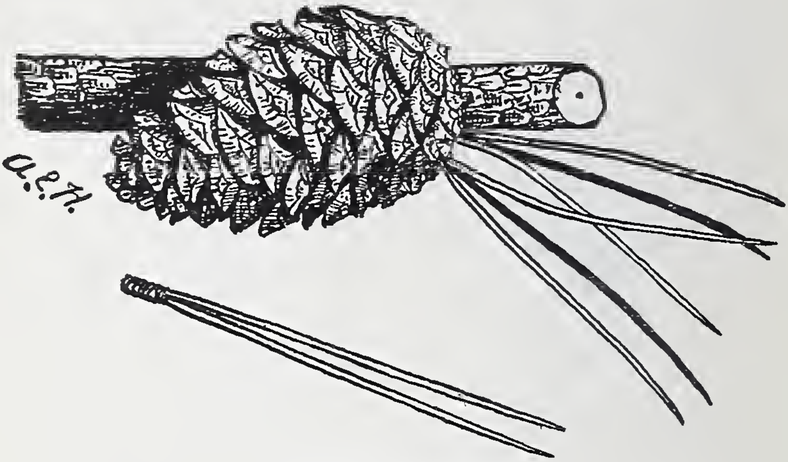
The BARK is dark in color and deeply furrowed, and often attains a thickness of as much as two inches on large-sized trees. The LEAVES, or needles, 6 to 9 inches long, are borne three, and sometimes two, in a cluster, and, in the spring, bright green clumps of them at the ends of branches give a luxuriant appearance to the tree. The FRUIT is a cone, or burr, about 3 to 5 inches long, which ripens in the autumn of the second year, and during fall and early winter, sheds many seeds which, by their inch-long wings, are widely distributed by the wind.

The resinous WOOD is coarse-grained, with marked contrast, as in the other yellow pines, between the bands of early and late wood. The wood of second-growth trees has a wide range of uses where durability is not a requisite, such as for building material, box shooks, barrel staves, basket veneers, pulpwood, lath, mine props, piling and fuel.

SHORTLEAF PINE (YELLOW PINE)

(*Pinus echinata* Mill.)

The shortleaf pine, also known as yellow or rosemary pine, is widely distributed throughout the eastern part of the State. It is the common pine of the hills and in the lowlands it forms pure stands. The young tree has a straight and stout stem with slightly ascending branches. The mature tree has a tall, straight stem and an oval crown, reaching a height of about 100 feet and a diameter of about 4½ feet. The young tree, when cut or burned back, reproduces itself by sprouting from the stump.



SHORTLEAF PINE
One-half natural size

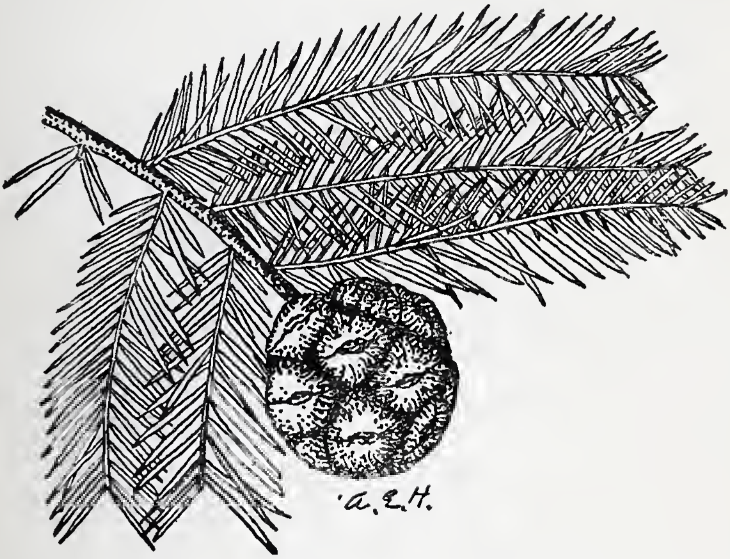
From Sargent's "Manual of the Trees of North America," by permission of Houghton-Mifflin Company

The LEAVES are in clusters of two or three, from 3 to 5 inches long, slender, flexible and dark blue-green. The CONES, or burrs, are the smallest of all our pines, 1½ to 2½ inches long, oblong, with small sharp prickles, generally clustered, and often holding to the twig for three or four years. The small seeds are mottled and have a wing, which is broadest near the center. The BARK is brownish red, broken into rectangular plates; it is thinner and lighter-colored than that of Loblolly Pine.

The WOOD of old trees is rather heavy and hard, of yellow-brown or orange color, fine-grained and less resinous than that of the other important Southern pines. It is used largely for interior and exterior finishing, general construction, veneers, paper pulp, excelsior, cooperage, mine props and other purposes.

CYPRESS (Bald Cypress)
(*Taxodium distichum* (L.) Rich.)

The cypress, or bald cypress, is confined to the borders of streams tributary to the Red River in the southeastern part of the State. Its straight trunk with numerous ascending branches, and narrow conical outline makes the tree one of considerable beauty.



CYPRESS
One-half natural size

In old age, the tree generally has a broad fluted or buttressed base, a smooth, slowly tapering trunk and a broad, open, flat top of a few heavy branches and numerous small branchlets. The largest tree in the State is of this species. It is on Mountain Fork, seven miles east of Broken Bow, and measures about ten feet in diameter and about 100 feet in height.

The BARK is silvery to cinnamon-red and finely divided by numerous longitudinal fissures. The LEAVES are about one-half to three-fourths of an inch in length, arranged in feather-like fashion along two sides of small branchlets which fall in the autumn with the leaves still attached; or they are scale-like and much shorter, light green and sometimes silvery below.

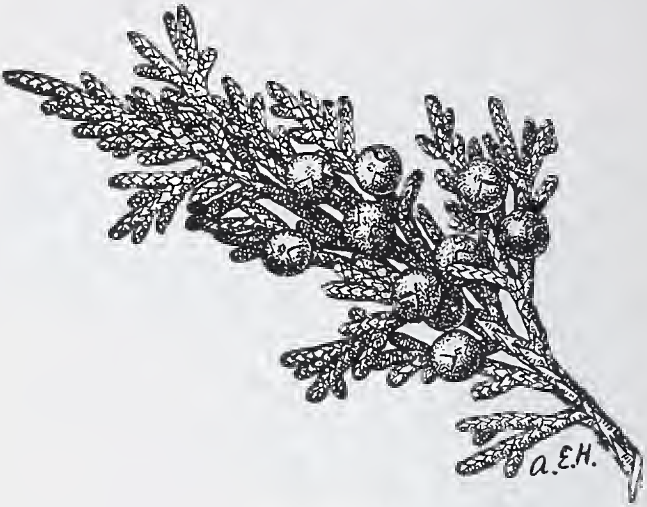
The FRUIT is a rounded cone, or "ball," about one inch in diameter, consisting of thick, irregular scales.

The WOOD is light, soft, easily worked, varies in color from a light sapwood to dark-brown heartwood, and is particularly durable in contact with the soil. Hence it is in demand for exterior trim of buildings, greenhouse planking, boat and ship building, shingles, posts, poles and crossties.

For decorative planting, this species is a very desirable ornamental tree. It does not develop the "knees" when growing out of water, suggesting that these peculiar structures may serve as breathing organs for the roots.

RED CEDAR *(Juniperus virginiana* L.)

A very valuable tree found in all classes and conditions of soils—from swamp to dry rocky ridges—seeming to thrive on barren soils where few other trees are found. It is scattered throughout the State.



RED CEDAR
(Natural size)

There are two kinds of LEAVES, usually both kinds being found on the same tree. The commoner kind is dark green, minute and scale-like, clasping the stem in four ranks, so that the stems appear square. The other kind, usually appearing on young growth or various shoots, is awl-shaped, quite sharp-pointed, spreading and whitened.

The two kinds of FLOWERS are at the end of minute twigs on separate trees. Blooming in February or March, the male trees often assume a golden color from the small catkins, which when shaken, shed clouds of yellow pollen. The FRUIT, which matures in one season, is pale blue, often with a white bloom, one-quarter of an inch in diameter, berry-like, enclosing one or two, or rarely three or four, seeds in the sweet flesh. It is a favorite winter food for birds.

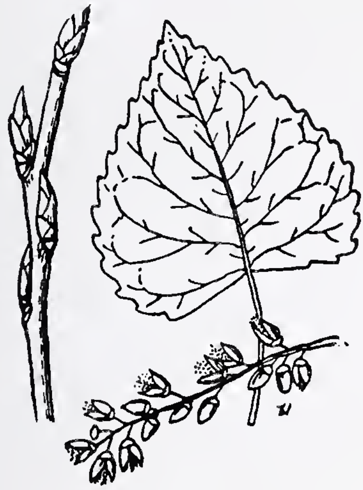
The BARK is very thin, reddish brown, peeling off in long, shred-like strips. The tree is extremely irregular in its growth, so that the trunk is usually more or less grooved.

The heart WOOD is distinctly red, and the sapwood white, this color combination making very striking effects when finished as cedar chests, closets and interior woodwork. The wood is aromatic, soft, strong and of even texture, and these qualities make it most desirable for lead pencils. It is very durable in contact with the soil, and on that account is in great demand for posts, poles and rustic work.

COTTONWOOD (CAROLINA POPLAR)

(*Populus deltoides virginiana* [Cast.] Seed.)

The cottonwood, or Carolina poplar, is found along streams throughout the State. The tree is easily propagated by cuttings and grows rapidly, hence it has been widely planted to get shade quickly. For this purpose, however, the tree is unsatisfactory, because it begins to shed the leaves by midsummer, the "cotton" from the female, or seed-bearing tree is often a nuisance, the soft wood is easily broken by winds, and the rank growth of the roots often results in stopping drain pipes and cracking and lifting sidewalks.



COTTONWOOD

Leaf, one-half natural size. Twig, one-third natural size.

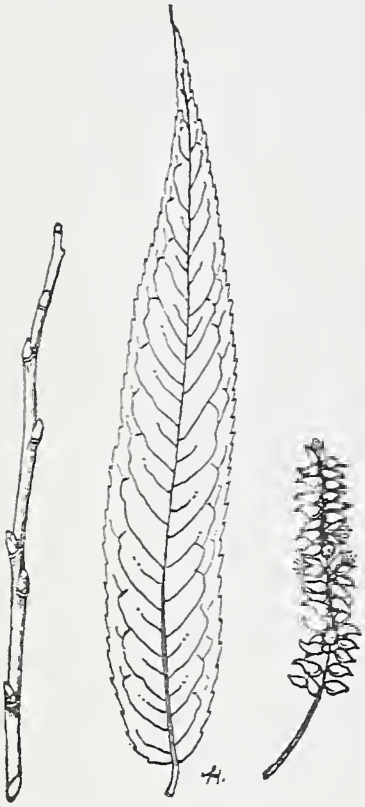
The LEAVES are simple, alternate, broadly ovate or triangular, pointed, square at the base, and coarsely toothed on the edges, 3 to 5 inches across each way, covered with soft white hairs on the under side, supported by flattened slender stems, 2 to 3 inches long. The winter buds are covered with chestnut-brown, resinous scales. The FLOWERS are in catkins of two kinds, male and female, and appear before the leaves. The FRUIT is a capsule containing numerous seeds, each of which has a cluster of white silky hairs, which carries it for long distances.

The WOOD is soft, light-weight, warps easily upon drying, but is used for many purposes, sometimes as a substitute for yellow poplar and linden. It makes the highest grade of gloss magazine paper for the printing of half-tone illustrations.

BLACK WILLOW

(*Salix nigra* Marsh.)

The black willow is found along streams throughout the State. It rarely grows to be over 50 feet in height and is frequently found growing singly or in clumps along water courses. In winter the easily separable, bright reddish-brown or golden, naked twigs are quite conspicuous.



BLACK WILLOW
Two-thirds natural size

The LEAVES are from 3 to 6 inches long and less than one-half an inch wide; the tips are very much tapered and the margins finely toothed. The leaves are bright green on both sides, turning pale yellow in the early autumn.

The FLOWERS are in catkins, the male and female on separate trees. The FRUIT is a capsule bearing numerous minute seeds which are furnished with long silky down, enabling them to be blown long distances.

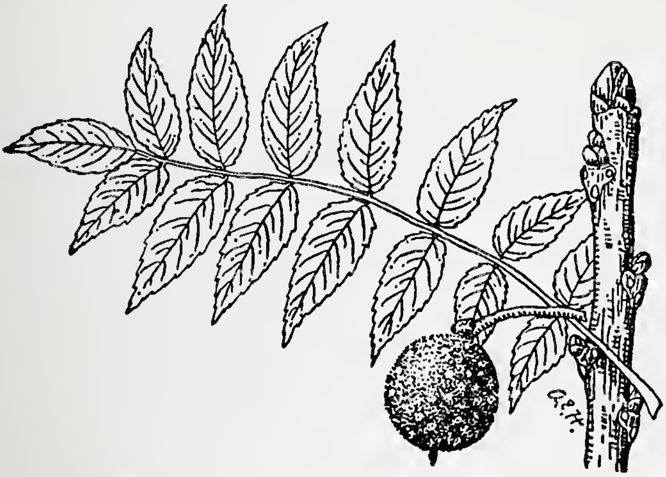
The BARK is deeply divided into broad, flat ridges which separate into thick plate-like scales. On old trees it becomes very shaggy. In color it varies from light brown tinged with orange to dark brown or nearly black.

The WOOD is soft, light and not strong. A high grade of charcoal, used in the manufacture of gunpowder, is obtained from willow wood, and it is the chief wood used in the manufacture of artificial limbs.

There are many species, or kinds, of willows not easily distinguished. They are of high value in checking soil erosion and waste along stream banks, for which purpose they should be more extensively grown.

BLACK WALNUT *(Juglans nigra* L.)

This valuable forest tree occurs on rich bottomlands and moist fertile hillsides, scattered throughout the State. In the forest, where it grows singly, it may attain a height of 100 feet with a straight stem, clear of branches for half its height. In open-grown trees the stem is short and the crown broad and spreading. Practically all of the large walnut has been cut in this State.



BLACK WALNUT
Leaf, one-fifth natural size. Twig, three-quarters natural size.

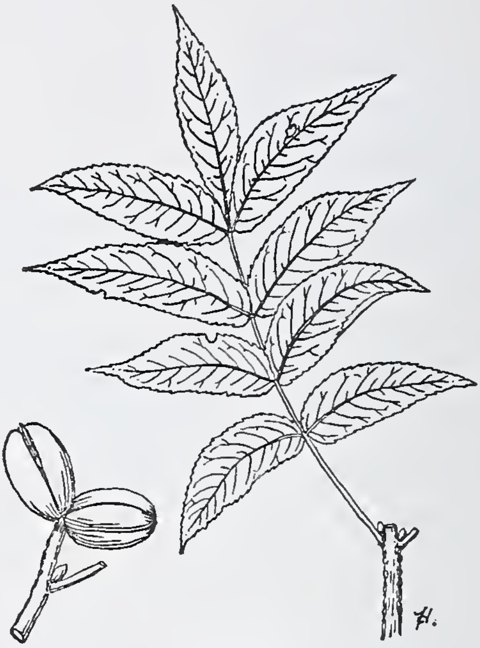
The LEAVES are alternate, compound, 1 to 2 feet long, consisting of from 15 to 23 leaflets of a yellowish green color. The leaflets are about 3 inches long, extremely tapering at the end, and toothed along the margin. The BARK is thick, dark brown in color, and divided by rather deep fissures into rounded ridges.

The FRUIT is a nut, borne singly or in pairs, and enclosed in a solid green husk which does not split open, even after the nut is ripe. The nut itself is black with a very hard, thick, finely ridged shell, enclosing a rich, oily kernel edible and highly nutritious.

The heart WOOD is of superior quality and value. It is heavy, hard and strong, and its rich chocolate brown color, freedom from warping and checking, susceptibility to a high polish and durability make it highly prized for a great variety of uses, including furniture and cabinet work, gun-stocks and airplane propellers. Small trees are mostly sapwood, which is light colored and not durable. Walnut is easily propagated from the nuts and grows rapidly on good soil, where it should be planted and grown for timber and nuts.

PECAN *(Hicoria pecan* [Marsh.] Britton.)
(Carya pecan Engler and Gr.)

The pecan is found native for the most part south and east of a diagonal line drawn from the northeast to the southwest corner of the State, but extends north of this line east of Garfield and Grant counties. It makes an excellent shade tree, and has been planted considerably for this purpose and for its nuts. The pecan is the largest of the hickories, attaining heights of over 100 feet and when grown in the open forming a large rounded top of symmetrical shape. The outer BARK is rough, hard, tight, but broken into scales; on the limbs, it is smooth at first but later tends to scale or divide as the bark grows old.



PECAN
One-quarter natural size

The LEAVES resemble those of the other hickories and the black walnut. They are made up of 9 to 17 leaflets, each oblong, toothed and long-pointed and 4 to 8 inches long by about 2 inches wide.

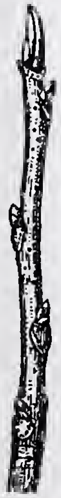
The FLOWERS appear in early spring and hang in tassels from 2 to 3 inches long. The FRUIT is a nut, 4-winged or angled, pointed, from 1 to 2 inches long, and one-half to 1 inch in diameter, borne in a husk which divides along its grooved seams when the nut ripens in the fall. The nuts, which vary in size and in the thickness of the shell, have been greatly improved by selection and cultivation and are sold on the market in large quantities.

The WOOD is strong, tough, heavy and hard and is used occasionally in making handles and parts of vehicles, and for fuel.

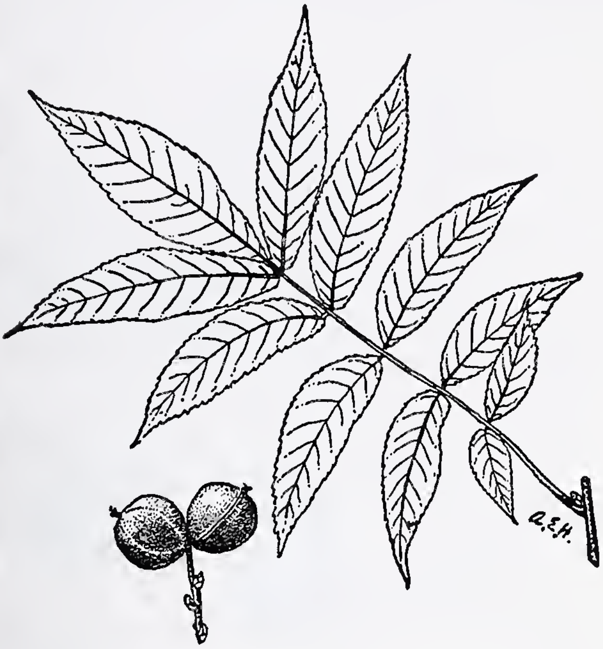
BITTERNUT HICKORY

(*Hicoria cordiformis* [Wang.] Britton)
(*Carya cordiformis* K. Koch.)

The bitternut or pignut hickory is a tall slender tree with broadly pyramidal crown, attaining a height of 100 feet and a diameter of 2 to 3 feet. It is found in the eastern part of the State on moist rich soils, but is nowhere very abundant.



Twig, one-half natural size



BITTERNUT HICKORY
Leaf, one-third natural size

The BARK on the trunk is granite-gray, faintly tinged with yellow and less rough than in most of the hickories, yet broken into thin, plate-like scales. The winter buds are compressed, scurfy, bright yellow, quite different from those of its relatives.

The LEAVES are alternate, compound, from 6 to 10 inches long, and composed of from 7 to 11 leaflets. The individual leaflets are smaller and more slender than those of the other hickories.

The FLOWERS are of two kinds on the same tree. The FRUIT is about 1 inch long and thin-husked, while the nut is usually thin-shelled and brittle, and the kernel very bitter.

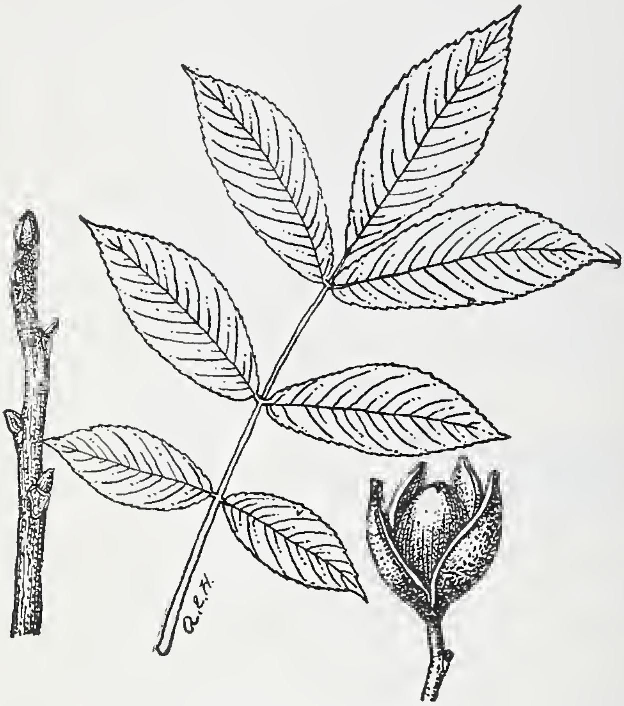
The WOOD is hard, strong and heavy, reddish brown in color. From this last fact it gets its local name of red hickory. It is said to be somewhat inferior to the other hickories, but is used for the same purposes.

Hicoria cordiformis latifolia (Sarg.) Ashe, a variety with wider leaflets, is reported from Rich Mountain.

NUTMEG HICKORY

(*Hicoria myristicaeformis* [Michx. f.] Britton)
(*Carya myristicaeformis* Nutt.)

The nutmeg hickory is found only in rich soil on the borders of streams and swamps. It is restricted in its distribution, known in the State from the flood plains and swamp bottoms of the Red River, as far west as western Choctaw County, where it may attain a height of about 90 feet and a trunk diameter exceeding 2 feet. It is often known locally as the "blasted pecan."



NUTMEG HICKORY
Leaf, one-quarter natural size. Fruit, one-half natural size. Twig, two-thirds natural size.

The BARK is dark brown, tinged with red, one-half to three-quarters of an inch thick, with shallow fissures, the ridges separating into irregular, close, dark, reddish-brown scales.

The LEAVES are compound, 8 inches to over a foot in length, having 5 to 9 short stalked or nearly sessile leaflets. The leaflets are dark green above, more or less hairy and silvery white lustrous below, with a hairy midrib, a very striking feature, by which this species may be recognized.

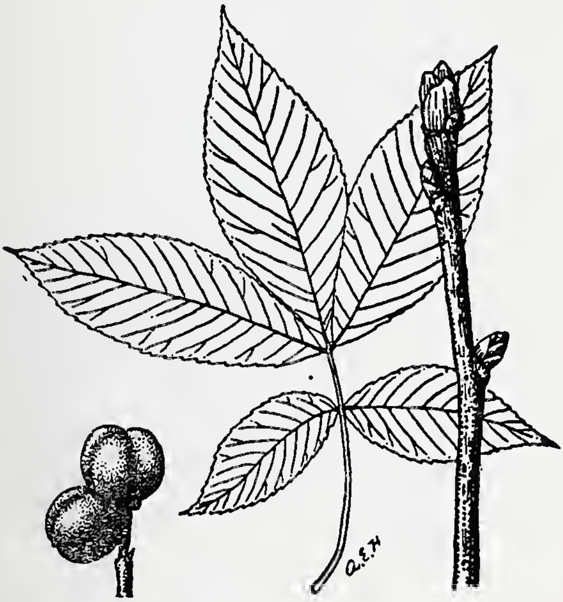
The FRUIT, which is also distinctive, is usually solitary 1½ inches long with four ridges to the base and covered with yellow-brown scurfy hairs. The husk is exceedingly thin, splitting nearly to the base. The NUT is ellipsoidal or sometimes slightly wider above the middle, pointed at the ends, and not flattened. The name applies to the nutmeg-like markings of gray streaks and spots on the surface of the reddish-brown nut, and to the thick and very hard bony shell. The seed is sweet.

The WOOD is hard, heavy, very strong, close-grained and tough, of light brown color, with a thick layer of sapwood involving 80 to 90 growth rings. It should be useful for manufactured parts where hickory is desirable. This is a rare hickory of North America but rather frequent in the Red River bottoms.

SCALY-BARK OR SHELL-BARK HICKORY

(*Hicoria ovata* [Miller] Britton) (*Carya ovata* K. Koch.)

The scaly-bark hickory is known by every child of the community because of its sweet and delicious nuts. It is a large commercial tree, averaging 60 to 100 feet high and 1 to 2 feet in diameter. It thrives best on rich, damp soil and is found along streams and on moist hillsides in the eastern part of the State.



SCALY-BARK HICKORY
Leaf, one-third natural size. Twig, one-half natural size.

The BARK of the trunk is rougher than on other hickories, light gray and separating into thick plates which are only slightly attached to the tree. The terminal winter buds are egg-shaped, the outer bud-scales having narrow tips.

The LEAVES are alternate, compound, from 8 to 15 inches long and composed of 5, rarely 7, obovate to ovate leaflets. The twigs are smooth or clothed with short hairs.

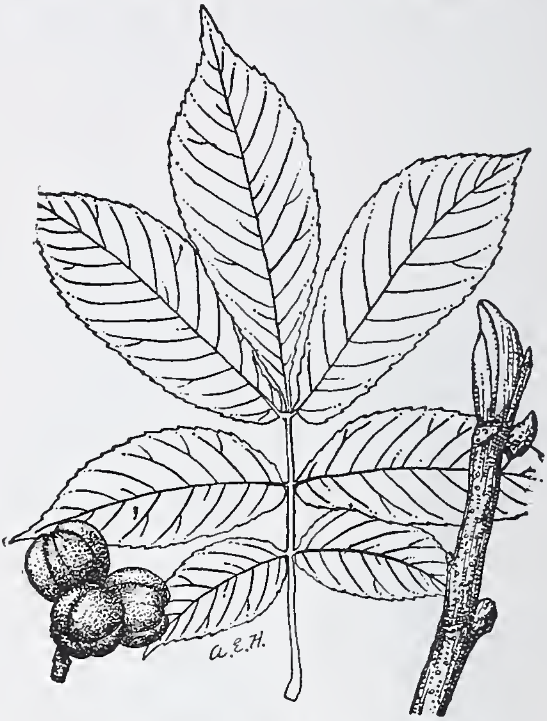
The FRUIT is borne singly or in pairs, and is globular. The husk is thick and deeply grooved at the seams. The nut is much compressed and pale, the shell thin and the kernel sweet. The FLOWERS are of two kinds, opening after the leaves have attained nearly their full size.

The WOOD is heavy, hard, tough and very strong. It is used largely in the manufacture of agricultural implements and tool handles, and in the building of wagons. For fuel the hickories are the most satisfactory of our native trees.

KING NUT HICKORY (BIG SHELL-BARK)

(Hicoria laciniosa Land.) *(Carya laciniosa* [Michx. f.] Sarg.)

The king nut hickory becomes a very large tree and is found in the rich bottom land forests of the eastern part of the State, usually in soil inundated during a part of the year. This tree may attain a height well over 100 feet in a straight slender trunk, not generally exceeding 3 feet in diameter, free from branches for a height of 60 feet. This species is often confused with the scaly-bark hickory, which it resembles, except for its larger size. King nut is distinguished also by its somewhat hairy orange-colored branchlets, the thick bony shell of its nut and the larger number of leaflets.



BIG SHELL-BARK HICKORY
Leaf, one-fifth natural size. Twig, two-thirds natural size.

The BARK is light gray, 1 to 2 inches thick, separating into plates as much as 4 feet long and clinging to the trunk for many years. The winter buds are large, sometimes an inch long and two-thirds of an inch wide.

The LEAVES are 15 to 22 inches long, compound, with 5 to 9 leaflets, the petioles often remaining attached to the branches through the winter.

The FRUIT is borne solitary or in pairs, is very large, nearly globular, slightly depressed at the apex, with a woody husk a fourth inch or more in thickness, brown at maturity, containing one or occasionally two nuts, 2 to 2½ inches long, about 1¾ inches wide and flattened, with a bony shell about one-fourth inch thick.

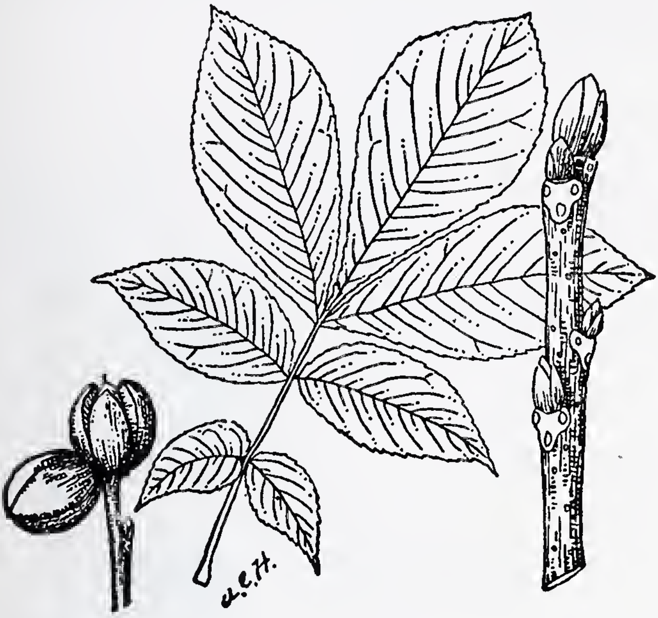
The WOOD is dark brown, very hard and tough, close-grained and very flexible, with a fairly narrow zone of white sapwood.

WHITEHEART OR WHITE HICKORY

(MOCKERNUT HICKORY)

(Hicoria alba [L.] Britton) *(Carya alba* K. Koch.)

The white hickory, whiteheart, mockernut or big-bud hickory, is common on well-drained soils in the eastern part of the State. It is a tall, short-limbed tree, averaging 60 feet high and 1 to 2 feet in diameter.



WHITEHEART OR WHITE HICKORY

Leaf, one-fifth natural size. Twig, two-thirds natural size.

The BARK is dark gray, hard, closely and deeply furrowed, often apparently cross-furrowed or netted. The winter buds are large, round or broadly egg-shaped, and covered with downy, hard scales. The recent shoots are short, stout and more or less covered with a downy growth.

The LEAVES are large, strong-scented and hairy, composed of 7 to 9 obovate to oblong, pointed leaflets which turn a beautiful yellow in the fall.

The FLOWERS, like those of all other hickories, are of two kinds on the same tree; the male in three-branched catkins, the female in clusters of 2 to 5. The FRUIT is oval, nearly round or slightly pear-shaped with a very thick, strong-scented husk which splits nearly to the base when ripe. The nut is of various forms, but is sometimes 4 to 6 ridged, light brown and has a very thick shell and small, sweet kernel.

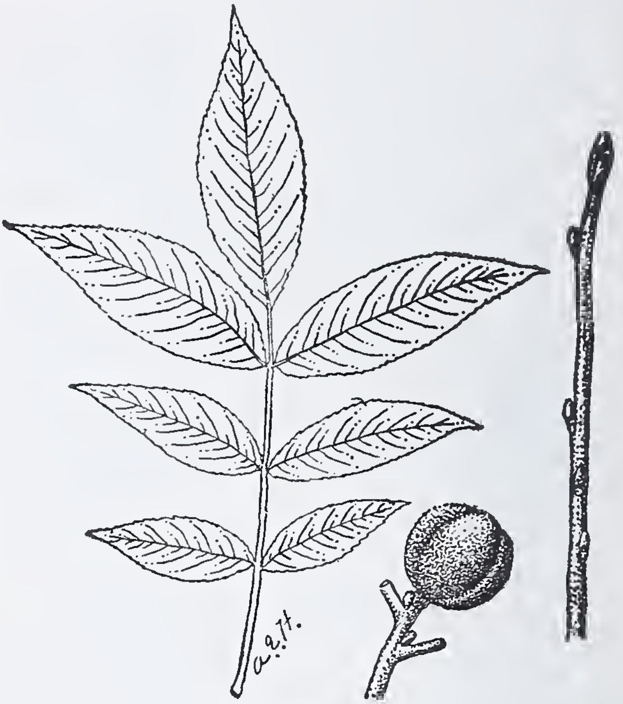
The WOOD is heavy, hard, tough and strong; it is white excepting the comparatively small, dark-brown heart, hence the name white hickory. It is used for vehicle parts and handles.. It furnishes the best of fuel. This and other hickories are very desirable both for forest and shade trees.

Hicoria alba ficoides (Sarg.) Sud., a variety having a fruit with a stipe-like base is reported from southeastern Oklahoma.

BLACK HICKORY

(*Hicoria buckleyi* [Dur.] Sud.)
(*Carya buckleyi* Dur.)

This is the most common hickory of the Ozark region. It is found on rocky hillsides or on sandy upland, and is distinguished by its obovoid fruit, and by its dusty brown hairs found on the young leaves and branches. It forms a tree 60 to 75 feet high, with a trunk 2 feet in diameter.



BLACK HICKORY
Leaf, one-quarter natural size. Fruit, one-third and Twig, three-quarters natural size.

The BARK is dark gray or nearly black, deeply divided into rough ridges, or it may be irregularly fissured and separating into thin scales. The winter buds are ovoid and covered with rusty hairs mixed with silvery scales.

The LEAVES are 8 to 12 inches long with 5 to 7, usually 7, leaflets and with rusty-hairy slender leafstalks. The leaves are dark green, lustrous above, and much paler beneath. The FLOWERS are similar to other hickories.

The FRUIT is obovoid, narrowed or abruptly contracted into a short stalk at the base with a husk one-twelfth to one-sixth inch thick, splitting to the middle or nearly to the base. The NUT is nearly obovoid to oblong rounded at the ends, compressed and slightly four-angled with a shell one-sixth to one-fifth inch thick. The seed is sweet.

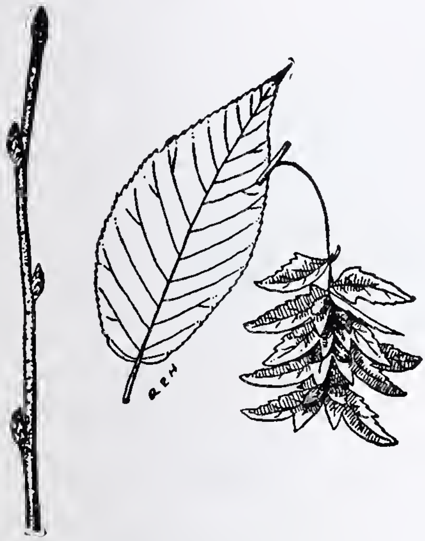
The WOOD is hard and brittle, used chiefly for fuel.

Hicoria buckleyi arkansana (Sarg.) Ashe, a variety having a flat topped fruit, is found in eastern Oklahoma.

BLUE BEECH

(*Carpinus caroliniana* Walt.)

The blue beech, known also as ironwood and hornbeam, is a small, slow-growing, bushy tree with a spreading top of slender, crooked, or drooping branches. It is found along streams and in low ground in the eastern part of the State. Its height is usually from 20 to 30 feet and its diameter 4 to 8 inches, although it sometimes grows larger.



BLUE BEECH
Leaf, two-thirds natural size
Twig, one-half natural size

The trunk is fluted with irregular ridges extending up and down the tree. The BARK is light brownish gray to dark bluish gray in color, sometimes marked with dark bands, extending horizontally on the trunk.

The LEAVES are simple, alternate, oval, long-pointed, doubly toothed along the margin, 2 or 3 inches in length. They resemble those of the true ironwood *ostrya.*

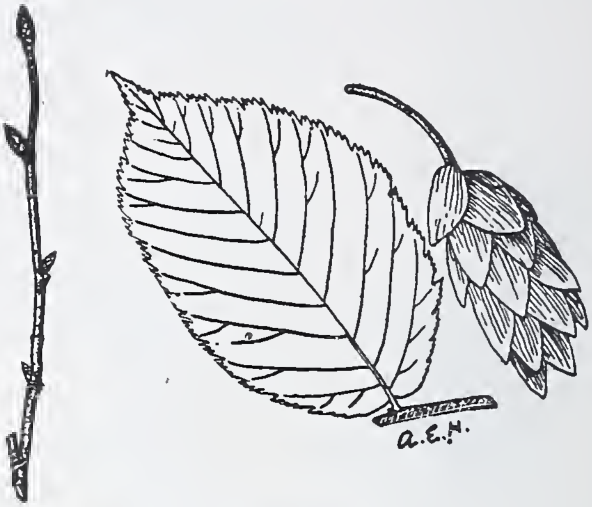
THE FLOWERS are borne in catkins separately on the same tree; the male catkin about 1½ inches long, the female about three-fourths of an inch, with small, leaf-like, 3-lobed green scales. The FRUIT is a nut about one-third of an inch long. It falls, attached to the leaf-like bract which acts as a wing in aiding its distribution by the wind.

The WOOD is tough, close-grained, heavy and strong. It is sometimes selected for use for levers, tool handles, wooden cogs, mallets, wedges, etc. It is also manufactured into charcoal for use in gas masks. The tree is of little commercial importance and often occupies space in the woods that should be utilized by more valuable kinds.

IRONWOOD (Hop Hornbeam)

(*Oystrya virginiana* [Miller] Koch.)

The tree gets its common names from the qualities of its wood and the hop-like fruit. It is a small, slender, generally round-topped tree, from 20 to 30 feet high and 7 to 10 inches in diameter. The top consists of long slender branches, commonly drooping toward the ends. It is found mostly on rather dry soils throughout the upland and mountain region of the eastern part of the State.



IRONWOOD

Twig, one-half natural size. Leaf, two-thirds natural size.

The BARK is mostly light brown or reddish brown, and finely divided into thin scales, giving it a shreddy appearance, by which the tree, after a little acquaintance, can be easily recognized.

The LEAVES are simple, alternate, generally oblong with narrowed tips, sharply toothed along the margin, sometimes doubly toothed, from 2 to 3 inches long.

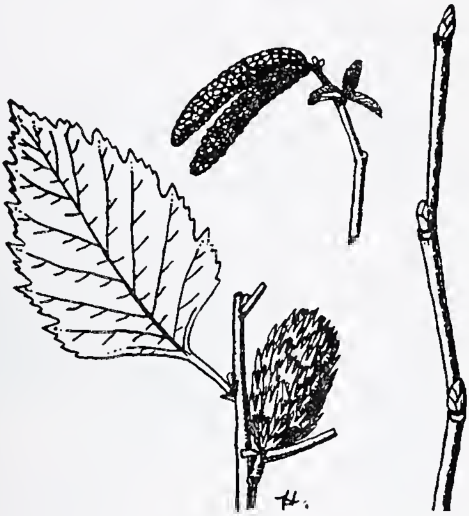
The FLOWERS are of two kinds on the same tree; the male, in drooping catkins which form the previous summer, the female, in erect catkins on the newly formed twigs. The FRUIT, which resembles that of the common hop vine, consists of a branch of leafy bracts 1 to 2 inches long containing a number of small flattened ribbed nuts.

The WOOD is strong, hard, durable, light brown to white, with thick pale sapwood. Often used for handles of tools, mallets and other small articles. It is also manufactured into charcoal for use in gas masks.

Ostrya virginiana glandulosa(Spach.) Sarg., a variety having persistent gland tipped hairs on the twigs is also found in Oklahoma.

RIVER BIRCH (RED BIRCH) *(Betula nigra* L.)

This is the only native birch found at low elevations in the South. It is at home, as the name implies, along water courses, and inhabits the deep, rich soils along the borders of streams, ponds, lakes and swamps which are sometimes inundated for weeks at a time. It is found in the eastern part of the State.



RIVER BIRCH
One-third natural size

The BARK provides a ready means of distinguishing this tree. It varies from reddish brown to cinnamon-red in color, and peels back in tough papery layers. These layers persist on the trunk, representing a very ragged and quite distinctive appearance. On older trunks, deeply furrowed and of a reddish-brown color.

The LEAVES are simple, alternate, 2 to 3 inches long, more or less oval in shape, with double-toothed edges. The upper surface is dark green and the lower a pale yellowish green.

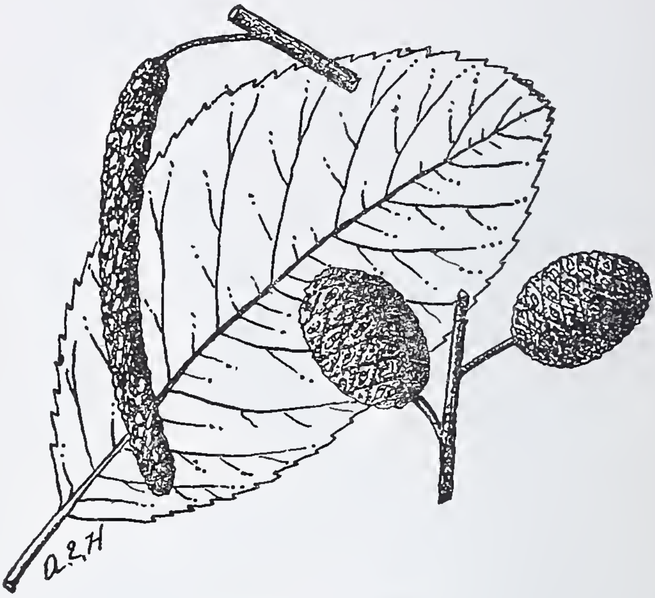
The FLOWERS are in catkins, the two kinds growing on the same tree. The FRUIT is cone-shaped about 1 inch long, and densely crowded with little winged nutlets that ripen from May to June.

The WOOD is strong and fairly close-grained. It has been to some extent used in the manufacture of woodenware, in turnery and for wagon hubs. Since, however, this tree is scattered in its distribution and mostly confined to the banks of streams, it does not figure largely in commercial lumbering, but is cut chiefly for firewood.

ALDER (Seaside Alder)

(*Alnus maritima* Nutt.)

This alder, which occurs on stream banks in Johnston and Bryan counties, strangely is known in only one other and far remote locality, namely, in southern Delaware and eastern Maryland. There it is known as the seaside alder, as its botanical name implies. A small tree or large shrub, the alder has a straight trunk, in size up to 5 inches in diameter, and a narrow round-topped head made up of small zig-zag branchlets.



SEASIDE ALDER
Natural size

The LEAVES are obovate, narrowed at the base, finely toothed along the margin, dark green and shiny, 2 to 4 inches long and 1 to 2 inches wide.

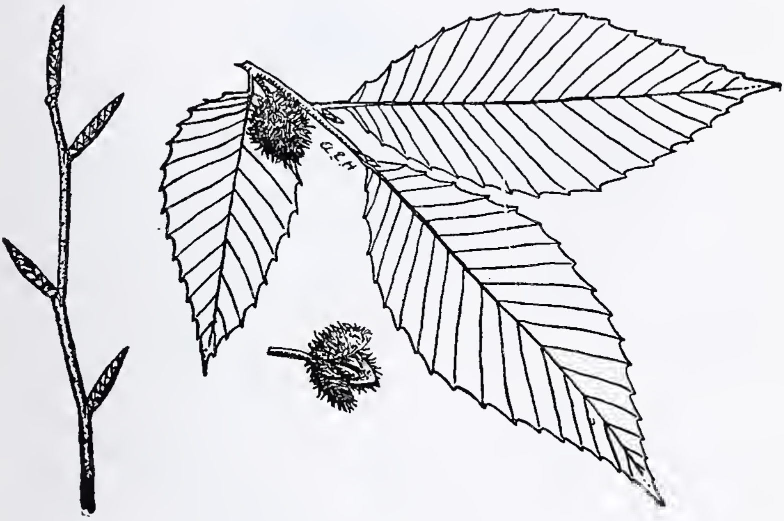
The FLOWERS which open in the fall are of two kinds on the same tree. The male, or staminate, flowers are slender catkins 2 to 3 inches long, and the female, or pistillate, are tiny cone-like flowers. The FRUIT is cone-like, broadly rounded, with many scales, about one-half inch long, dark brown or nearly black, and matures in late summer or early fall. The opened fruit hangs on well into the next season.

The WOOD is light, soft and very close-grained. It has no special uses.

BEECH

(*Fagus grandifolia Caroliniana* [London] F. & R.)

The beech occurs near the Arkansas line from Page south into the upper branches of Mountain Fork River, where it is found on well-drained bottoms. It is one of the most beautiful of all trees, either in summer or winter.



BEECH
One-half natural size

The simple, oval LEAVES are 3 to 4 inches long, pointed at the tip, and coarsely toothed along the margin. When mature, they are almost leathery in texture. The beech produces a dense shade. The winter buds are long, slender and pointed.

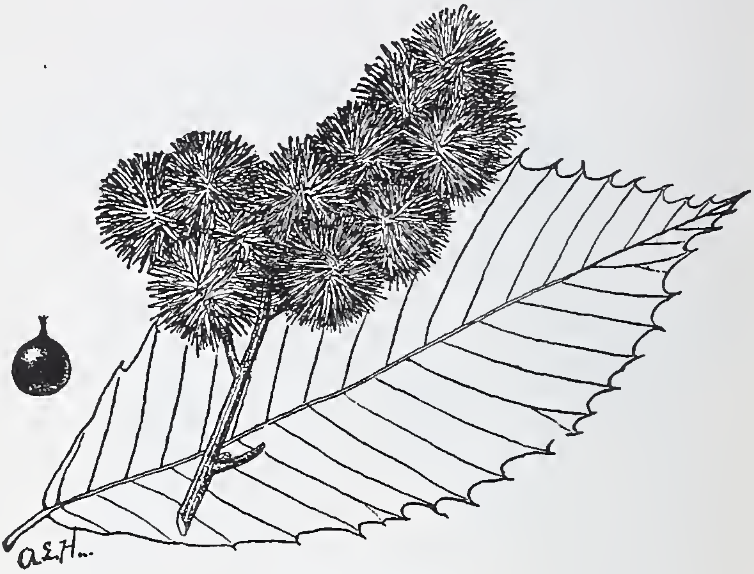
The BARK is, perhaps, the most distinctive character as it maintains an unbroken, light gray surface throughout its life. So tempting is this smooth expanse to the owner of a jack-knife that the beech has been well designated the "initial tree."

The little, brown, three-sided beech NUTS are almost as well known as chestnuts. They form usually in pairs in a prickly burr. The kernel is sweet and edible, but so small as to offer insufficient reward for the pains of biting open the thin-shelled husk.

The WOOD of the beech is very hard, strong and tough, though it will not last long on exposure to weather or in the soil. The tree is of no great economic importance as a lumber tree, though the wood is used to some extent for furniture, flooring, carpenters' tools and novelty wares.

CHINQUAPIN *(Castanea ozarkensis* Ashe)

This small tree occurs at rare intervals in the eastern part of the State on both lowlands and dry uplands, but is most frequently found in the higher mountains. It is usually under 10 inches in diameter and less than 30 feet high. The trunk is short and straight but often not vertical and bears a rounded head made up of slender, spreading branches. Sometimes the small trees, less than 10 feet in height, form dense thickets.



CHINQUAPIN
One-half natural size.

The shade LEAVES are ovate-oblong to oblong, often globovate; sun leaves pale, pubescent beneath, sometimes doubly serrated, thick, terminating in a long in-curved or reflexed awn.

BARK on twigs tan; glabrous, 2 to 4 inches thick.

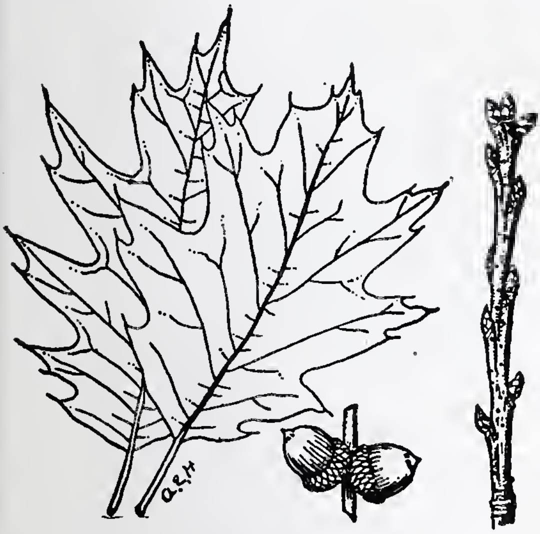
FRUIT, a single nut, borne in a burr only a little more than an inch in diameter covered with numerous and densely set spines. The nut is rounded, dark chestnut-brown, shiny and the thin coat, lined inside with fine whitish hairs, contains a sweet kernel, which is prized for food.

The WOOD is light, hard, strong, coarse-grained; it is suitable for fence posts, crossties and fuel; but, because of its small size and comparative scarcity, it is of little economic importance.

NORTHERN RED OAK

(*Quercus borealis maxima* [Marsh.] Ashe)
(Formerly *Q. rubra* L.)

The northern red oak occurs in the eastern part of the State, but is most common and of best quality in the mountains. It is sometimes called "mountain water oak" and is not found in swamps. It usually attains a height of about 70 feet and a diameter ranging from 2 to 3 feet, but is sometimes much larger. The forest-grown tree is tall and straight with a clear trunk and narrow crown.



NORTHERN RED OAK
Leaf, one-third natural size.
Twig, one-half natural size

The BARK on young stems is smooth, gray to brown, on older trees thick and broken by shallow fissures into regular, flat, smooth surfaced plates.

LEAVES are simple, alternate, 5 to 9 inches long and 4 to 6 inches wide, broader towards the tip, divided into 7 to 9 lobes, each lobe being somewhat coarsely toothed and firm, bristle-tipped, dull green above, paler below, often turning a brilliant red after frost.

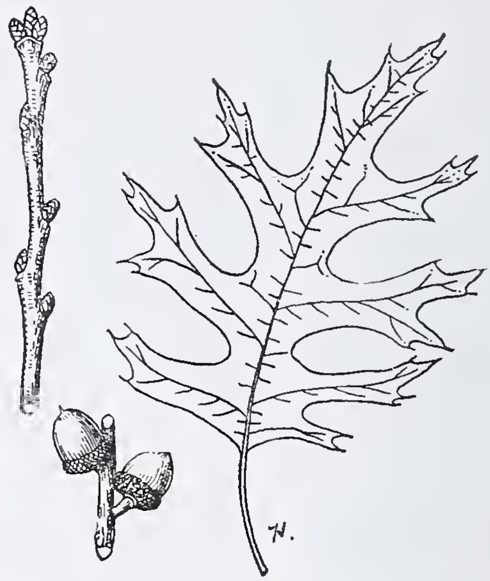
The FLOWERS, as in all the oaks, are of two kinds on the same tree, the male in long, drooping, clustered catkins, opening with the leaves, the female solitary or slightly clustered. The FRUIT is a large acorn maturing the second year. The nut is from three-fourths to 1¾ inches long, blunt-topped, flat at base, with only its base inclosed in the very shallow dark-brown cup.

The WOOD is hard, strong, coarse-grained, with light reddish-brown heartwood and thin lighter-colored sapwood. It is used for cooperage, interior finish, construction, furniture and crossties. Because of its average rapid growth, high-grade wood and general freedom from insect and fungus attack, it should be widely planted in the higher portions of the State for timber production and as a shade tree.

SPOTTED OAK (TEXAS OAK)

(*Quercus shumardii* Buckl., formerly *Q. texana* Sarg.)

This tree, sometimes confused with northern red oak, spanish oak and black oak, is found in the eastern and southern parts of the State on well-drained alluvial soils, and on mountain slopes, especially on limestone soils. It forms a tall, wide-spreading, rather open head. The BARK is dark, rough, divided into ridges and usually from 1 to 1½ inches thick. It does not usually compose the principal part of any forest stand, but it more often occurs as individuals. It attains a diameter of over 3 feet and a height of more than 100 feet, but is usually much smaller.



SPOTTED OAK

Twig, one-half natural size. Leaf, one-third natural size.

The LEAVES are simple, alternate, 6 to 8 inches long by 4 to 5 inches wide, mostly seven-lobed, and each one slightly lobed or deep-toothed. They resemble those of the scarlet oak and are smaller and more deeply lobed than those of the black oak.

The FRUIT is a small acorn, about two-thirds of an inch in diameter and three-quarters of an inch long, set in a shallow cup.

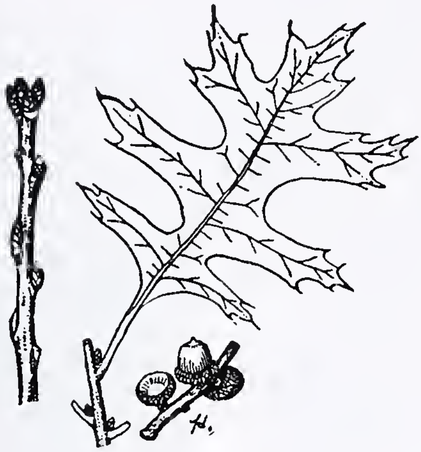
The WOOD is heavy, hard, strong, close-grained and light reddish-brown in color. It is used much as other red oak.

Quercus shumardii schneckii, Sarg., a variety having rougher dark-grayish bark and deeper cups to the acorns, is a common form in the upland portions of the State.

PIN OAK

(*Quercus palustris* Muench.)

Pin oak is rarely found except on the rich moist soil of bottomlands and the borders of swamps. It occurs in northeastern Oklahoma, extending eastward to the Atlantic Ocean. It is usually not abundant in any locality, but found scattered with other kinds of trees. It more commonly attains heights of 50 to 70 feet, with diameters up to 2 feet, but is sometimes larger. The tree commonly has a single, upright stem with numerous long, tough branches, the lower ones drooping, the middle horizontal, and the upper ascending. The many small bristling twigs and branches give the tree its name. The BARK on young stems is smooth, shining and light brown; on old trunks light gray-brown and covered by small, close scales. Because of its beauty, its hardiness and its fairly rapid growth, pin oak makes an exceptionally fine street tree.



PIN OAK

Leaf, one-third natural size. Twig, one-half natural size.

The LEAVES generally resemble those of scarlet oak, but the rounded openings do not extend quite so near to the midrib; they average somewhat smaller, being 3 to 5 inches long and 2 to 4 inches wide.

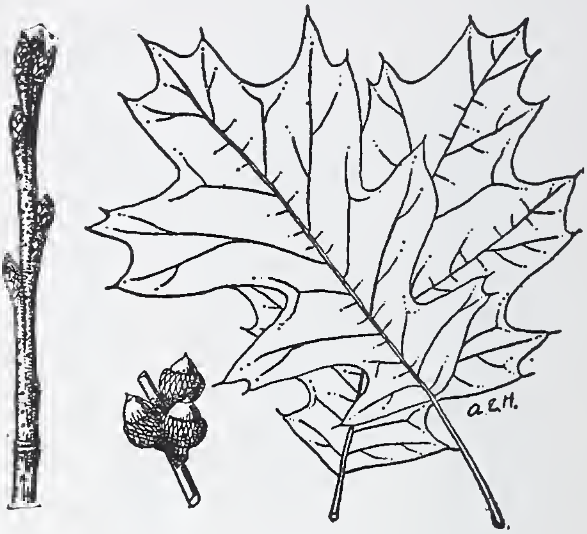
The FLOWERS are of two kinds on the same tree, and appear when the leaves are about one-third grown. The FRUIT, taking two years to mature, is an acorn nearly hemispheric, about one-half inch long, light brown, often striped, enclosed only at the base in a thin, shallow, saucer-shaped cup.

The WOOD is heavy, hard, strong and usually knotty. It is light brown, with thin, darker-colored sapwood. It is sold and has some uses as red oak, although it is generally not so good in quality.

BLACK OAK

(*Quercus velutina* Lam.)

The black oak usually grows to be about 60 feet in height and 1 to 3 feet in diameter. It is found in the eastern part of the State on dry plains and ridges, but seldom on rich ground. The crown is irregularly shaped and wide, with a clear trunk for 20 feet or more on large trees.



BLACK OAK

Twig, one-half natural size. Leaf, one-third natural size.

The BARK on the very young trunks is smooth and dark-brown, but soon becomes thick and black, with deep furrows and rough broken ridges. The bright-yellow color and bitter taste of the inner bark, due to tannic acid, are distinguishing characters.

The LEAVES are alternate, simple, 5 to 10 inches long, and 3 to 8 inches wide, shallow or deeply lobed, the shape varying greatly. When mature, the leaves are dark green and shiny on the upper surface, pale on the lower, more or less covered with down, and with conspicuous rusty brown hairs in the forks of the veins.

The FRUIT matures the second season. The light-brown nut is from one-half to 1 inch long, more or less hemispherical in shape, and from one-half to three-quarters inclosed in the thin, dark-brown, scaly cup. The kernel is yellow and extremely bitter.

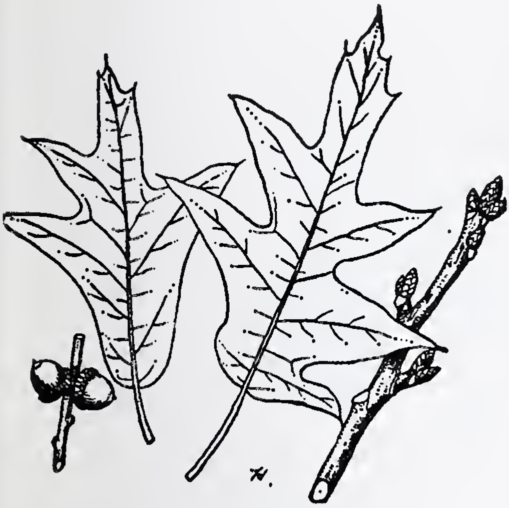
The WOOD is hard, heavy, strong, coarse-grained and checks easily. It is a bright red-brown with a thin outer edge of paler sapwood. It is used for the same purposes as red oak, under which name it is put on the market. Its growth is rather slow.

Quercus velutina missouriensis (Sarg.), a variety having mature leaves covered with fascicled hairs above, with rusty pubescence below and having more loosely imbricated cup scales, is found throughout the Oklahoma range.

SOUTHERN RED OAK

(*Quercus rubra* L., formerly *Q. digitata* Sudw.)

The southern red oak, commonly known as red oak and referred to in books as Spanish oak, usually grows to a height of 70 to 80 feet and a diameter of 2 to 3 feet, though larger trees are not infrequently found. It is found in the eastern part of the State. Its large spreading branches form a broad, round, open top. The BARK is rough, though not deeply furrowed, and varies from light gray on younger trees to dark gray or almost black on older ones.



SOUTHERN RED OAK
Leaf, one-third natural size.
Twig, one-half natural size.

The LEAVES have irregular - shaped lobes, mostly narrow, bristle-tipped, the central lobe often the longest. They are dark lustrous green above and gray down beneath, the contrast being strikingly seen in a wind or rain storm.

The FLOWERS appear in April while the leaves are unfolding. The FRUIT ripens the second year. The small rounded acorn, about half an inch long, is set in a thin saucer-shaped cup which tapers to a short stem.

The WOOD is heavy, hard, strong, coarse-grained and is less subject to defects than most other red oaks. It is used for rough lumber and for furniture, chairs, tables, etc. It is a desirable timber tree, especially on the poorer, drier soils. The bark is rich in tannin.

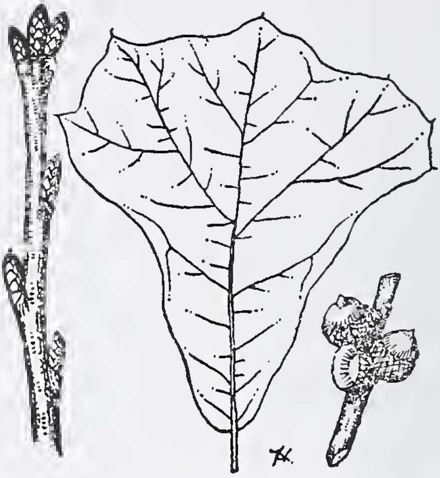
The freedom of this tree from disease, its thrifty growth, large handsome form and long life make it very desirable for shade or ornamental use.

Quercus rubra triloba (Michx.) Ashe, a variety having three acute or rounded lobes and an acute or rounded base, is frequently found with the type. Occasionally both forms of leaves are found on the same tree.

BLACK JACK OAK

(*Quercus marilandica* Muench.)

The occurrence of blackjack oak is said to indicate poor soil. It is certain that it often occurs on dry or poorly drained gravelly, clay or sandy upland soils where few other forest trees thrive. This perhaps accounts chiefly for its slow rate of growth. It is found in most parts of the State that support a natural tree growth. The tree sometimes reaches a height of 50 or 60 feet and a diameter of 16 inches, but it is usually much smaller. Its hard, stiff, drooping branches form a dense crown which usually contains many persistent dead twigs. The BARK is rough, very dark, often nearly black, and broken into small, hard scales or flakes.



BLACK JACK OAK

Twig, two-thirds natural size. Leaf, one-third natural size.

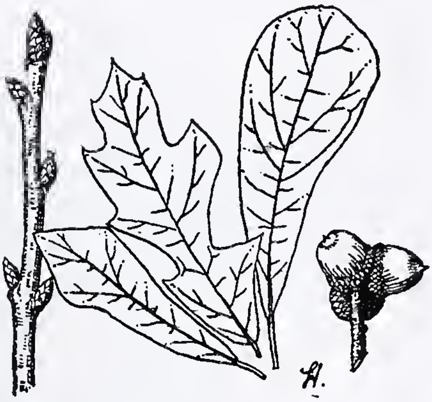
The LEAVES are of leathery texture, dark green on the upper surface, lighter underneath, broadly wedge-shaped, 4 to 10 inches long and about the same in width. The FRUIT is an acorn about three-quarters of an inch long, yellow-brown and often striped, inclosed for half its length or more in a thick light-brown cup.

The WOOD is heavy, hard and strong; when used at all, it is used mostly as firewood.

WATER OAK

(*Quercus nigra* L.)

The water oak is found native along the borders of swamps and streams and on rich bottom lands in the eastern part of the State. It has been widely planted in the southern states along streets and in parks as a shade tree. When fully grown this tree reaches a height of about 80 feet and a diameter of from 1 to over 3 feet. The trunk is shapely. The BARK is smooth, light-brown tinged with red, and has many smooth thin scales over the surface. The water oak can be most readily distinguished from the willow oak—a close associate, but longer lived—by the differences in the general shape and size of the leaves.



WATER OAK
Leaf, one-third natural size. Twig, one-half natural size.

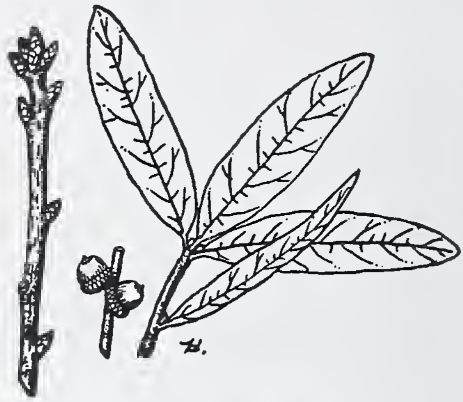
The LEAVES are simple, quite variable in shape, mostly oblong, broader near the point, and narrower at the base, giving a wedge-shaped effect. They are usually slightly three-lobed, at the outer end, thin and of a dull bluish-green color, paler below than above; mostly smooth, and usually 2 to 3 inches long and 1 to 1½ inches wide; they remain green for some time and gradually fall from the tree during the winter.

The FLOWERS appear in April when the leaves are beginning to unfold. The FRUIT, or acorn, matures at the end of the second season. The acorn is from one-half to two-thirds of an inch in length and nearly as broad, light brown or yellowish-brown and often striped, inclosed at the base only in a thin saucer-shaped cup.

The WOOD is heavy, hard and strong, light brown in color, with lighter-colored sapwood. It is not used to a great extent as lumber, but the trees are cut and utilized for piling, crossties and fuel.

WILLOW OAK *(Quercus phellos* **L.)**

The willow oak, often called water oak, occurs in the eastern part of the State, except on the higher slopes and mountains. It is most often found in lowlands and along the borders of rivers and swamps, but often also on rich sandy uplands. It is a beautiful and long-lived tree, and desirable for roadsides, lawns and parks, for which it has been widely planted.



WILLOW OAK

Twig, one-half natural size. Leaf, one-third natural size.

The slender willow-like LEAVES, on a tree whose habit of growth is manifestly that of an oak, make the tree easy to identify in the forest. The leaves are 2 to 4 inches long and one-half to 1 inch wide, with smooth or slightly wavy margin, bristle-pointed, smooth, light green and shiny above, but dull and usually smooth below; alternate in arrangement on the twig and borne on a short stout stem. The BARK is generally smooth and of a reddish-brown color; with age, the bark becomes slightly roughened and divided by narrow ridges.

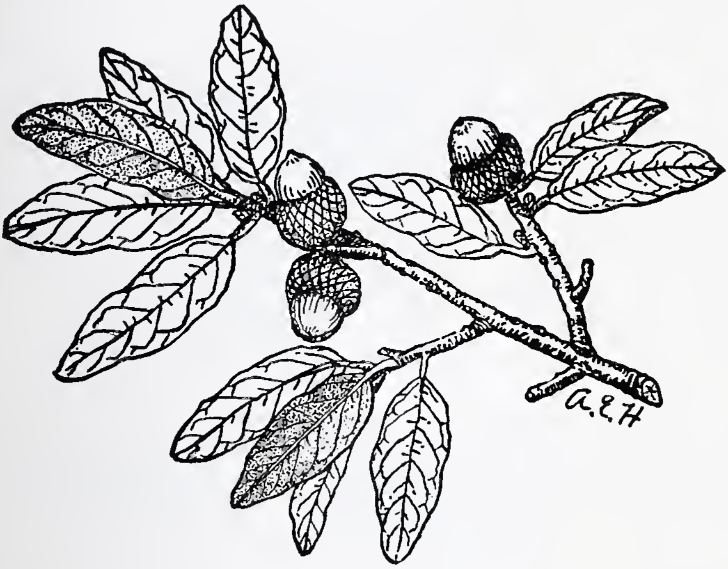
The small ACORNS, closely set along the stem, mature at the end of the second year. The nut is a light-brown hemisphere, about one-half an inch in diameter, its base scarcely enclosed in the shallow, reddish-brown cup. The nuts are eaten as food by bluejays, grackles ("black birds") and several other species of birds, as well as by rodents.

The WOOD is not separated commercially from other species in the red oak group. It is heavy, strong, rather coarse-grained, light brown tinged with red, and not durable when exposed to the weather. It is used locally for crossties, bridge planks, barn sills and general construction.

SHIN OAK

(*Quercus mohriana* Rydb.)

A small tree with spreading or bushy top, the shin oak is one representative of a group of oaks characteristic of the semi-arid Southwest. It is found in the western part of the main body of Oklahoma, and in the extreme western end of the Panhandle.



SHIN OAK
(Quercus mohriana Rydb.)

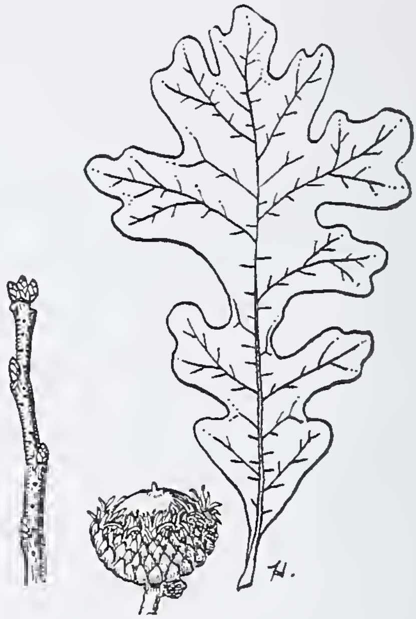
The BARK is thin, and deeply furrowed and rough. The LEAVES are 2 to 4 inches long by about an inch wide, oblong, with wavy or toothed edges, thick and gray-green in color.

The male flowers, or aments, are in short pendant clusters, and the female very small. Like all of the white oak group, the FRUIT, or acorn, ripens in one season. Its cup encloses the small rounded nut for about one-half of its length, and is much thicker and rougher at the base than at the top or outer edge. The acorns form in pairs or singly and are attached closely to the branchlets.

The WOOD is of little commercial importance, used mostly for firewood. It has not been studied to any great degree, chiefly because of the small size of the tree and its general inferiority to that of some of the other oaks.

BURR OAK (Mossy Cup Oak)
(*Quercus macrocarpa* Michx.)

The burr oak occurs throughout the State except in the Panhandle, in rich bottom lands along streams, or even on rich hillsides along spring-fed ravines. The name alludes to the fringe around the cup of the acorn, which is sometimes very large. The tree usually has a broad top of heavy spreading branches and a relatively short body. In maturity, it attains a diameter of 5 feet or more and a height of over 80 feet.



BURR OAK
One-third natural size.

The BARK is light-gray and is usually broken up into small narrow flakes. The burr oak does not often form a part of the forest stand, as do some other oaks, but occurs generally singly in open stands in fields. It requires a moist but well-drained soil.

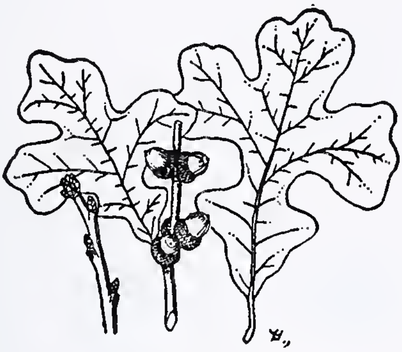
The LEAVES resemble somewhat those of the common white oak, but are much larger and have a pair of deep indentations on their border near the base, and wavy notches on the broad middle and upper portions of the leaf. They range from 6 to 12 inches long and 3 to 6 inches wide. The FRUIT, or acorn, is a nut set deeply in the fringed cup. It is usually 1 inch or much more in diameter, but varies widely in respect to size and the degree to which the nut is inclosed in the mossy fringed cup.

The WOOD is heavy, hard, strong, tough and durable. It is used for much the same purposes as the other white oaks—for lumber, crossties and fuel.

POST OAK

(*Quercus stellata* Wang., formerly *Q. minor* Sarg.)

The post oak is usually a medium-sized tree, with a rounded crown, commonly reaching a height of 50 to 60 feet and a diameter of 1 to 2 feet, but sometimes considerably larger. It occurs throughout the eastern half of the State and is scattered over parts of the western half. It is most abundant on the poorer soils.



POST OAK
One-third natural size.

The BARK is rougher and darker than the white oak and broken into smaller scales. The stout young twigs and the leaves are coated at first with a thick light-colored fuzz which soon becomes darker and later drops away entirely.

The LEAVES are usually 4 to 5 inches long and nearly as broad, deeply 5-lobed with broad rounded divisions, the lobes broadest at the ends. They are thick and somewhat leathery, dark green and shiny on the upper surface, lighter green and rough hairy beneath.

The FLOWERS, like those of the other oaks, are of two kinds on the same tree, the male in drooping, clustered catkins, the female inconspicuous. The FRUIT is an oval acorn, one-half to 1 inch long, set in a rather small cup which may or may not be stalked.

The WOOD is very heavy, hard, close-grained, light to dark brown, durable in contact with the soil. It is used for crossties and fence posts and along with other oaks of the white oak class for construction work.

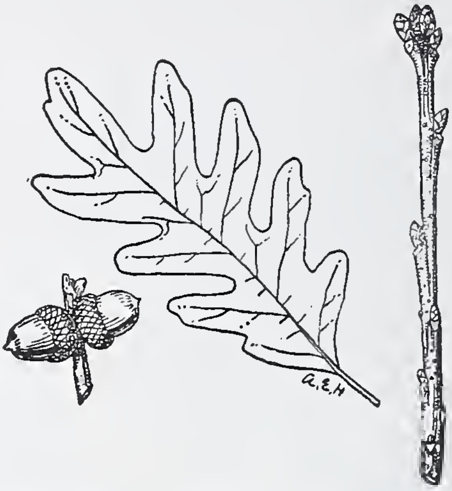
Quercus stellata araniosa Sarg., a variety having smooth upper surface and persistent tomentum on lower surface of leaves, is reported from southeast Oklahoma.

Quercus stellata margaretta Sarg., a variety having leaves with rounded or pointed lobes rather than squarish, found in eastern and central Oklahoma.

Quercus stellata rufescens Sarg., a variety having rusty tomentum on the under surface of the leaves, is shrubby in form and is probably locally known as one of the shin oaks.

WHITE OAK *(Quercus alba* L.)

Within its natural range, which includes practically the entire eastern half of the United States, the white oak is one of the most important timber trees. It commonly reaches a height of 60 to 100 feet and a diameter of 2 to 3 feet; sometimes it becomes much larger. It is found in a wide variety of soils. When grown in a dense stand it has a straight continuous trunk, free of side branches for over half its height. In the open, however, the tree develops a broad crown with far-reaching limbs. Well-grown specimens are strikingly beautiful.



WHITE OAK

Leaf, one-third natural size. Twig, one-half natural size.

The LEAVES are alternate, simple, 5 to 9 inches long and about half as broad. They are deeply divided into 5 to 9 rounded, finger-like lobes. The young leaves are a soft silvery gray or yellow or red while unfolding, becoming later bright green above and much paler below. The nut is three-quarters to one inch long, light brown, about one-quarter enclosed in the warty cup. It is relished by hogs and other livestock. The BARK is thin, light ashy gray and covered with loose scales or broad plates.

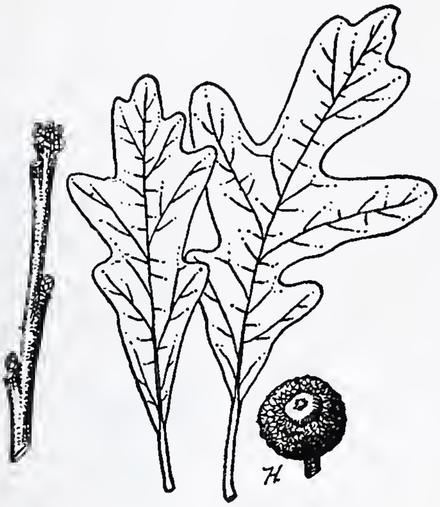
The WOOD is useful and valuable. It is heavy, strong, hard, tough, close-grained, durable and light brown in color. The uses are many, including construction, shipbuilding, tight cooperage, furniture, wagons, implements, interior finish, flooring and fuel. Notwithstanding its rather slow growth, white oak is valuable for forest, highway and ornamental planting.

Quercus alba latiloba Sarg., a variety having shallower sinuses in the leaves, is found with the type.

OVERCUP OAK

(*Quercus lyrata* Walt.)

The overcup oak, sometimes known as the swamp white oak and water white oak, becomes a large tree with small, often pendulous branches. It is found in moist, rich bottomland in southeastern Oklahoma.



OVERCUP OAK
Twig, two-thirds natural size. Leaf and Fruit, one-third natural size.

The LEAVES are 7 to 9 inches long, 1 to 4 inches broad, oblong, wider towards the point, narrowed at the base, dark green above, often whitish beneath, with 7 to 9 distinct pointed lobes. They frequently turn to a bright scarlet or to scarlet and orange in the fall. The BARK is rough, flaky, gray tinged with red.

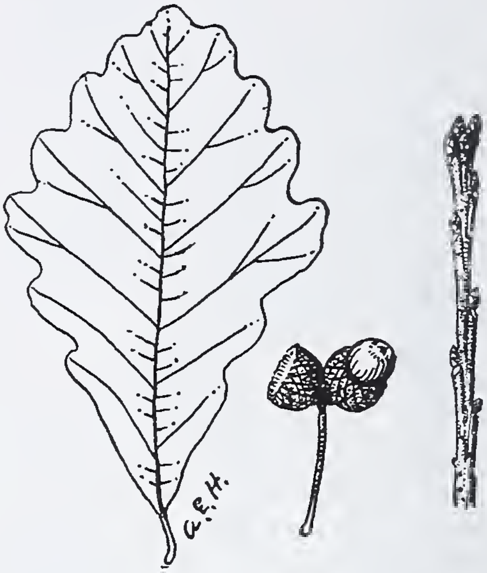
The FLOWERS open with the unfolding of the leaves. The acorns, or fruit, ripens the first year. It is thoroughly characteristic of the species. The large rounded or somewhat flattened acorn, an inch or more across and one-half to 1 inch high, is nearly covered by the ovate or nearly spherical cup, which is thickened at the base, but gradually grows thinner, often irregularly split at the margin of the cup. The name of the tree comes from this characteristic.

The WOOD is heavy, hard, strong and durable and is used for the same purposes as that of white oak.

SWAMP WHITE OAK

(*Quercus bicolor* Wild., formerly *Q. platanoides* Sudw.)

The swamp white oak, as the name implies, inhabits the low grounds and bottomlands, and in general appearance is much like that of the true white oak. It is found chiefly in the northeastern part of the State, in association with several other oaks, maples, ashes and hickories.



SWAMP WHITE OAK
One-half natural size

The BARK is deeply and irregularly divided by fissures into broad ridges of a grayish-brown color.

The LEAVES are generally broader at or beyond the middle length (pear-shaped) and wedge-shaped toward the base, wavy and indented along the margin, dark green and shiny above and grayish and fuzzy beneath, and 5 to 6 inches in length by 2 to 4 inches in width. The chestnut oak and swamp chestnut oak have leaves somewhat similar, but acorns of different shape and larger.

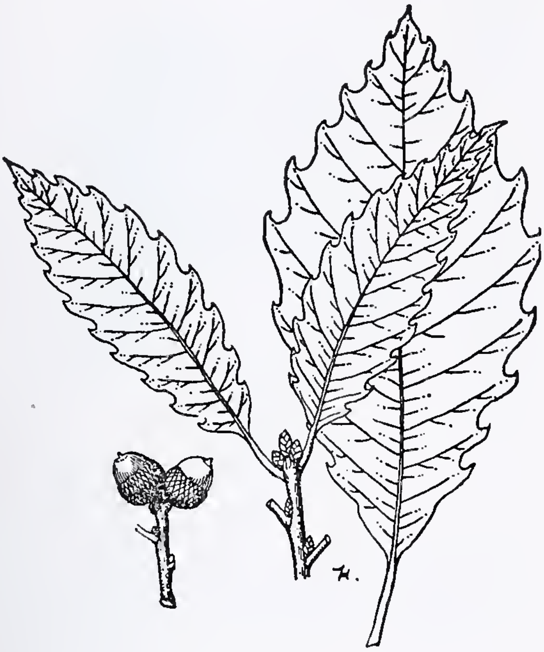
The acorn, or FRUIT, occurs commonly in pairs and requires only one season to mature. It is borne on slender stalks from 2 to 4 inches in length. The nut, or acorn proper, is about 1 inch long by two-thirds of an inch thick and enclosed for about one-third its length in a thick narrow-shaped cup.

The WOOD is heavy, hard, strong and tough and used for similar purposes as the true white oak, such as furniture, cabinet work, flooring, cooperage, ties, fence posts and fuel.

CHINQUAPIN OAK (CHINQUAPIN, PIN OAK)

(*Quercus muhlenbergii* Engelm., formerly
Q. acuminata Sarg.)

This oak, which is an excellent timber tree, occurs throughout the eastern part of the State and as far west at Custer County. It grows on practically all classes of soil and in all moisture conditions except in swamps, and is a very tenacious tree on shallow, dry soil. The BARK is light gray, and breaks up into short narrow flakes on the main trunk and old limbs.



CHINQUAPIN OAK
One-third natural size

It reaches a height of 20 to 50 feet. The straight shapely trunk bears a round-topped head composed of small branches, which makes it an attractive shade tree.

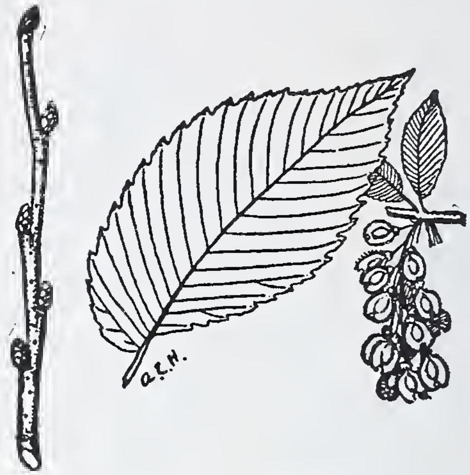
The LEAVES are oblong, 3 to 7 inches in length, 1½ to 3 inches wide, and equally toothed or notched on the edges, resembling the leaves of the chestnut oak. The FRUIT, which ripens in the fall of the first season, is light to dark brown when ripe, and edible if roasted. This acorn is from one-half to nearly an inch long, usually less than one inch in diameter, and is set in a shallow cup.

The WOOD is heavy, very hard, tough, strong, durable and takes an excellent polish. It is used in manufacturing lumber and timbers, crossties, fence posts and fuel. A portion of the lumber no doubt goes into furniture.

WHITE ELM (American Elm)

(Ulmus americana L.)

The famous shade tree of New England, whose range, however, extends nearly to the Rocky Mountains and southward to Texas. Within this vast area, it is generally common except in the high mountains and wet bottomlands. It reaches an average height of 60 to 70 feet and a diameter of 2 to 3 feet. The BARK is dark gray, divided into irregular, flat-topped, thick ridges, and is generally firm, though on old trees it tends to come off in flakes. An incision into the bark will show alternate layers of brown and white.



WHITE ELM

Twig, one-half natural size. Leaf, one-half natural size.

The LEAVES are alternate, simple, 4 to 6 inches long, rather thick, somewhat one-sided, doubly toothed on the margin, and generally smooth above and downy below. The leaf veins are very pronounced and run in parallel lines from the midrib to leafedge.

The FLOWERS are small, perfect, greenish, on slender stalks sometimes an inch long, appearing before the leaves in very early spring. The FRUIT is a light green, oval samara (winged fruit) with the seed portion in the center and surrounded entirely by a wing. A deep notch in the end of the wing is distinctive of the species. The seed ripens in the spring and by its wing is widely disseminated by the wind.

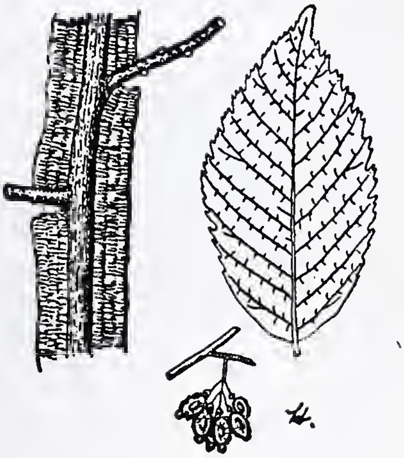
The WOOD is heavy, hard, strong, tough and difficult to split. It is used for hubs of wheels, saddle trees, boats and ships, barrel hoops and veneer for baskets and crates.

Because of its spreading fan-shaped form, graceful pendulous branches and long life, the white elm justly holds its place as one of the most desirable shade trees.

WINGED ELM

(*Ulmus alata* Michx.)

The winged elm gets its common name from the thin corky growth or "wings" usually found on the smaller branches. On large rapidly-growing trees the wings are often absent. It is found in the eastern part of the State, extending west to Garfield County, usually on dry uplands, but often in moist soils along streams and in waste places. It grows rapidly in moist situations, and at the same time is one of the best trees for planting along roadsides in dry poor locations. It is comparatively free from disease, though not notably long-lived. This elm is a medium-sized tree of 40 to 50 feet in height and rarely as large as 2 feet in diameter. It forms a rather open, round-topped head.



WINGED ELM
Two-thirds natural size

The BARK is light brown, tinged with red, and divided into irregular flat ridges and fissures.

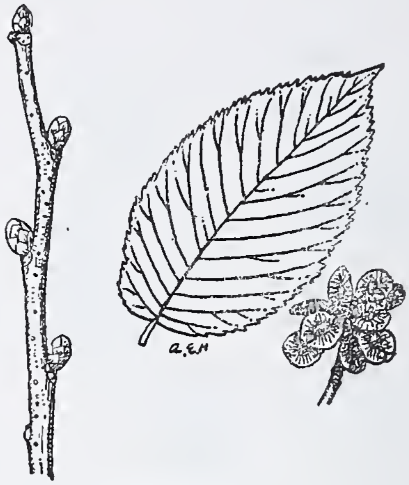
The LEAVES are simple, alternate, 2 to 4 inches long and 1 to 2 inches broad, coarsely double-toothed, thick, dark green and smooth above and pale and softly downy below. They are small and pointed at the tip, which distinguishes them from the small blunt leaves of the cedar elm.

The FLOWERS appear in early spring, long before the leaves unfold. The FRUIT ripens in the spring about the time the leaves appear; it is winged, tipped with two small incurved awns or beaks, oblong, reddish-brown, about one-third of an inch long, with a long slender stalk at the base and covered with white hairs.

The WOOD is very similar to that of the other elms—heavy, hard, strong and difficult to split. It is occasionally used for hubs and mauls. Formerly, rope made of the inner bark was used for binding the covers to cotton bales.

SLIPPERY ELM (Red Elm) (*Ulmus fulva* Michx.)

The slippery elm, or red elm, is found in the eastern and southern parts of the State. It is found principally on the banks of streams and on low hillsides in rich soil. It is a tree of small to moderate size, but noticeably wide-spreading. It is usually less than 40 feet in height and 6 inches in diameter, although trees of larger dimensions are occasionally found.



SLIPPERY ELM

Twig, one-half natural size. Leaf, one-third natural size.

The BARK on the trunk is frequently 1 inch thick, dark grayish-brown, and broken by shallow fissures into flat ridges. An incision into the bark shows no alternate brown and white layers. The inner bark is used to some extent for medicinal purposes, as it is fragrant and, when chewed, affords a slippery, mucilaginous substance, whence the tree gets its name.

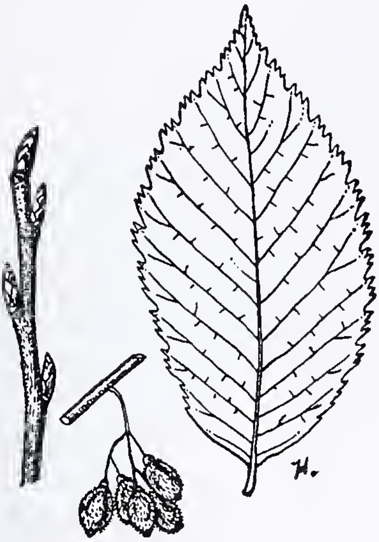
The LEAVES are simple, alternate on the stem, 4 to 6 inches in length, sharp-pointed, their bases unsymmetrical, doubly-toothed on the edges, thick, dark green and rough on both sides.

The FRUIT consists of a seed surrounded by a thin, broad, greenish wing, about one-half an inch in diameter; the FLOWERS appear in early spring and the fruit ripens when the leaves are about half grown.

The WOOD is close-grained, tough, strong, heavy, hard, moderately durable in contact with the soil. It is used for fence posts, crossties, agricultural implements, ribs for small boats and for some other purposes.

RED ELM (Black Elm)
(Ulmus serotina Sarg.)

This elm, also known as black elm, is found in the eastern part of the State. It occurs on rocky shallow limestone soil. It is occasionally found on deep bottom soil and would evidently spread in a prolific manner if it were not kept down by various forms of tillage. The old growth, once quite abundant, has been mostly cut. On good soil this elm reaches a diameter of 2 or 3 feet and a height of 70 feet or even more.



RED ELM

Leaf, one-third natural size. Twig, two-thirds natural size.

The BARK is dark, sometimes with a reddish tinge, and divided into narrow flakes or strips. The tree is often free of branches for 30 to 40 feet to where the trunk divides into several stout spreading limbs, forming a broad round-topped head of drooping branches often tinged with red.

The LEAVES are simple, alternate, oblong, narrow-pointed, with notched edges and vary in length from 2 to 4 inches.

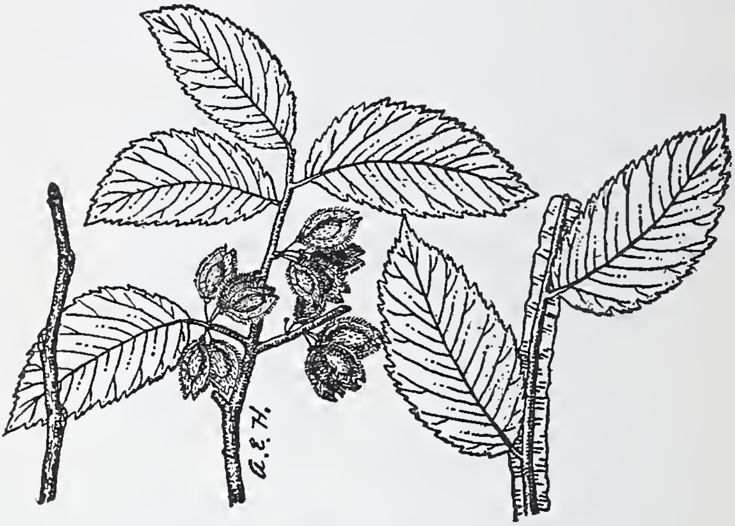
The FLOWERS appear in September and the fruit is seen soon afterward. The FRUIT resembles somewhat the beggar-lice, but it does not cling to one's clothes.

The WOOD is heavy, hard, strong, light brown tinged with red, and readily subject to decay if used in the ground. It is used for lumber, veneer and fuel.

CEDAR ELM

(*Ulmus crassifolia* Nutt.)

This elm is found in the southeastern part of the State, near streams in deep rich soil and on dry limestone hills. It forms a tree up to 75 feet high with a tall straight trunk 2 to 3 feet in diameter, having an inversely conic round-topped head and drooping branches.



CEDAR ELM
Three-fourths natural size

The BARK is light brown tinged with red, deeply fissured, with flattened scaly-ridges. The young twigs are finely velvet and reddish, sometimes developing thin corky wings.

The LEAVES are small, the largest less than 2 inches long, often doubly toothed and usually rather blunt at the tip. Their upper surface is dark green, very rough, while the lower surface and leaf stem are hairy.

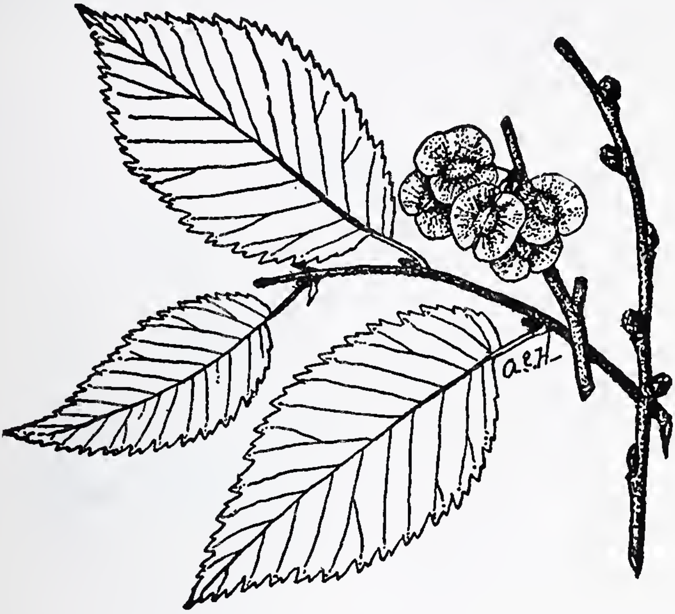
The FLOWERS appear in the autumn, are in small short-stalked clusters in axils of the leaves. The FRUIT is an oval-shaped samara slightly more than a quarter of an inch long, hairy all over, especially on the edges, and deeply notched at the tip. The seeds are disseminated by the wind.

The WOOD is reddish-brown, brittle, with a thick layer of lighter colored sapwood. It is sometimes used in the manufacture of hubs, furniture and for fencing. Often planted as a shade tree.

CHINESE OR SIBERIAN ELM

(Ulmus pumila)

An elm native to Manchuria, a province in northern China, and first brought to this country by the Office of Foreign Plant Introduction of the U. S. D. A. in 1908. It was probably first planted in Oklahoma in 1917 on the grounds of the Woodward Dry Land Field Station in the 24-inch rainfall belt of the northwestern part of the State. On sandy soil there and receiving clean cultivation it has grown to a miximum of 14 inches d. b. h. and 41 feet tall in thirteen years.



CHINESE ELM
Three-fourths natural size

The LEAVES are somewhat smaller than those of our American elms, but larger than those of the winged elm.

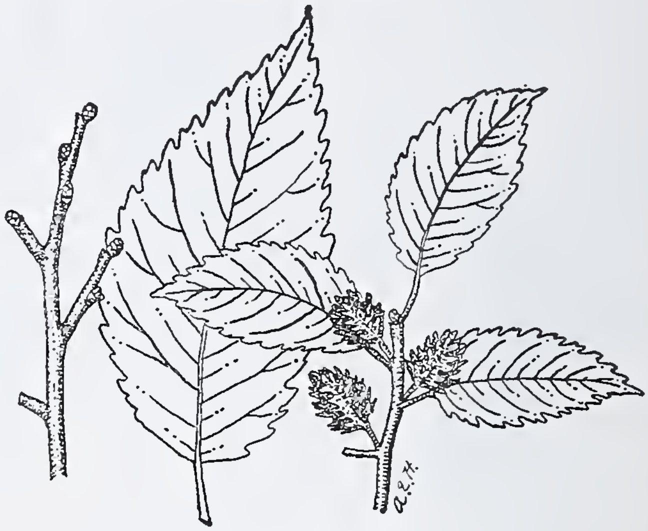
The round and relatively large flower buds are prominent during the winter and open earlier in the spring than our native elms. frequently resulting in damage by late frosts. The FRUIT is slightly larger than that of the American elm. Trees as young as four years bear fertile seeds.

The WOOD seems to resemble that of our native elms, although in young trees in this country it is sometimes rather soft and sappy. In China it is used for wheel hubs and similar purposes.

The twigs are long and slender. There is a considerable tendency for the tree to bush out at the base, requiring careful pruning to develop a straight, well-formed tree. Once cut off, however, these lower branches are not inclined to sprout out again. This tree gives good promise as a shade and general purpose tree on the central and southern Great Plains. It is now being extensively planted, especially in the western part of the State for shade, wind-break and woodlot purposes. In China it is often close planted and trimmed to form hedges or screens. It seems to do well on all except wet sites and is quite a rapid grower.

WATER ELM (Planer Tree)
(*Planera aquatica* Walt. Gmel.)

The water elm or planer tree is found on low wet flood plain of the larger streams of the eastern part of the State where wate stands during several months of the year. It forms a small spreading tree with a low broad head 30 to 40 feet in height and with a maximum trunk diameter of 20 inches.



WATER ELM
Nearly natural size

The BARK is light brown or gray, about one-quarter inch thick, and separates into large scales.

The LEAVES resemble those of the small-leaved elms. They are 2 to 2½ inches long, three-quarters to 1 inch wide on short stalks, dark dull green above and paler on the lower surface with yellowish veins.

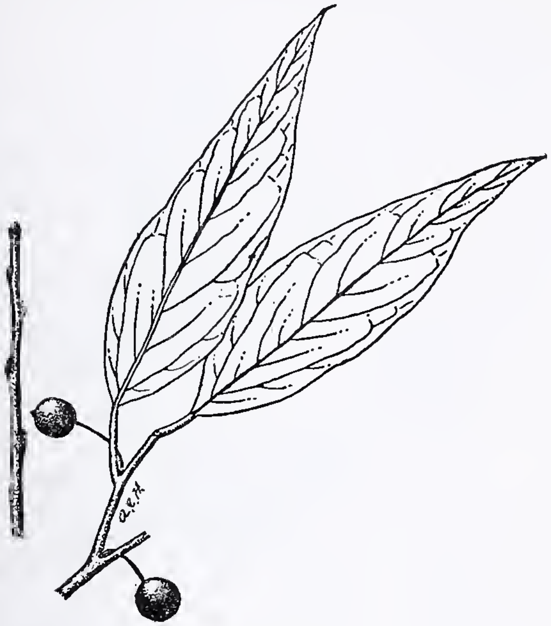
The FLOWERS appear with the leaves in March or early April. The small flowers are sometimes normal, and sometimes the male and female flowers are borne separately on the same tree. The FRUIT is a peculiar rounded, shaggy appearing body, about three-eighths of an inch long. It consists of a nut-like center, covered with soft and very irregular wing-like outgrowths, which extend out on all sides from the center.

The WOOD is light brown, coarse-grained and soft, very light in weight, and has a broad zone of nearly white sapwood. It has no economic value.

SOUTHERN HACKBERRY (SUGARBERRY)

(*Celtis laevigata* Wild., *Celtis mississippiensis* Spach.)

The southern hackberry or sugarberry is found in the eastern part of the State. It occurs most abundantly and of greatest size in rich alluvial soil, but thrives, however, on various types of soil from the richest to the poorest. It is usually a small or medium sized tree from 30 to 50 feet high and 10 to 20 inches in diameter, though it sometimes gets much larger. Its limbs are spreading or pendulous, forming a broad head, and its branchlets are slender and light green, glabrous or pubescent when young, and bright reddish-brown during their first winter. In the open, the crown is very symmetrical. It makes an excellent shade tree.



SOUTHERN HACKBERRY
Leaf and Fruit, one-half natural size. Twig, two-thirds natural size.

The BARK is pale gray and covered with prominent excrescences.

The LEAVES are simple, oblong-lanceolate, one-sided, 2½ to 5 inches long, thin, with the edges smooth.

The FLOWERS are not conspicuous, and are borne on slender smooth stems, appearing in April or May, and are of a creamy-greenish color. The FRUIT is short-oblong to pear-shaped, orange-red or yellow, one-fourth inch in diameter and ripens in September. The sweet character of the fruit has given rise to the name sugarberry, and makes it sought as food by birds and animals.

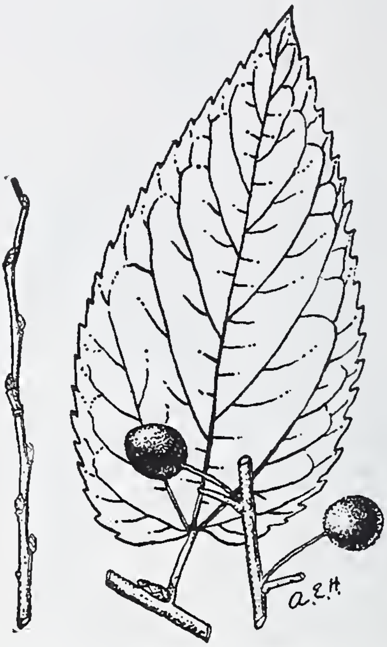
The WOOD is soft, weak, close-grained and light yellow and is used occasionally for flooring and furniture, but chiefly for fuel.

Celtis laevigata texana is found in western Oklahoma. The leaves are shorter and broader. Usually shrubby in form.

ROUGH-LEAVED HACKBERRY

(*C. occidentalis crassifolia* [La M.] Gray.)

The rough-leaved hackberry is found in the eastern and in the northwestern parts of the State on various types of soil. It is usually a medium sized to large tree, becoming 60 to 100 feet or more high and 10 to 20 inches in diameter. Its limbs are often crooked and angular and bear a head made of slender, pendant branches or short, bristly, stubby twigs. In the open, the crown is generally very symmetrical. It makes an excellent shade tree.



ROUGH-LEAVED HACKBERRY
Leaf, one-third natural size. Twig, one-half natural size.

The BARK is brownish-gray, 1 inch or more thick, and generally very rough with many scale-like or warty projections of dead bark.

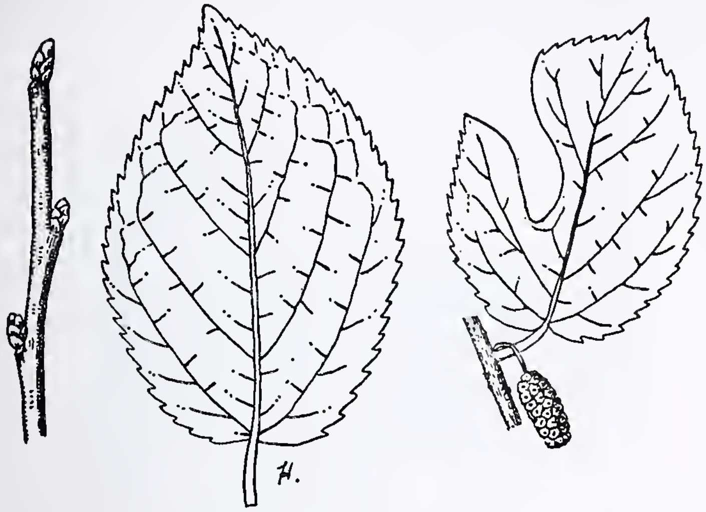
The LEAVES are simple, ovate, alternate, one-sided, 2 to 4 inches long, thick and very rough above, green on both surfaces, the edges toothed toward the long point. The FLOWERS are inconspicuous, and the two kinds are borne on the same tree. They appear in early spring and are of a creamy greenish color. The FRUIT is a round, somewhat oblong drupe, dark purple, one-third of an inch in diameter, ripening in September. It has a thin, purplish skin, and sweet yellowish flesh. The fruit frequently hangs on the tree most of the winter.

The WOOD is heavy, rather soft, weak and decays readily when exposed. It is used chiefly for fuel, but occasionally for lumber.

Celtis occidentalis canina (Raf.) Sarg., a variety having more pointed leaves which are thinner and nearly smooth on the upper surface, is found in southwestern Oklahoma.

RED MULBERRY *(Morus rubra* L.)

The red mulberry occurs throughout the State except in the extreme western portion. It prefers the rich soils of the lower and middle districts, but is nowhere abundant. It is commonly called mulberry as there are no other native species. The white mulberry and paper mulberry, which are sometimes found in waste places, are introduced species which have to some extent become naturalized. The red mulberry is a small tree, rarely 50 feet high and 2 feet in diameter, often growing in the shade of larger trees.



RED MULBERRY

Twig, two-thirds natural size. Leaf, one-third natural size.

The BARK is rather thin, dark grayish-brown, peeling off in long narrow flakes.

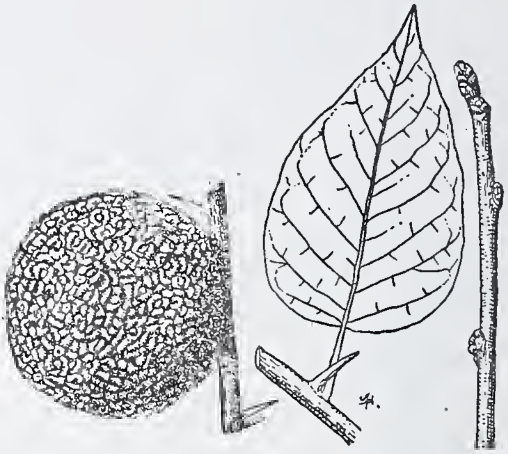
The LEAVES are alternate, thin, rounded or somewhat heart-shaped, toothed, pointed, 3 to 5 inches long, rough hairy above and soft hairy beneath. Often some of the leaves, especially on young trees and thrifty shoots, are mitten-shaped or variously lobed.

The FLOWERS are of two kinds on the same or different trees, in long drooping catkins, the female catkins shorter, appearing with the leaves. The FRUIT is dark red or black, and resembles a blackberry; however, a stalk extends through it centrally, and it is longer and narrower. The fruit is sweet and edible and greatly relished by birds and various animals.

The WOOD is rather light, soft, not strong, light orange,yellow, very durable in contact with the soil. It is chiefly used for fence posts. The tree might be planted for this purpose and to furnish food for birds.

OSAGE ORANGE (Bois d'Arc)
(Toxylon pomiferum Rafn.)

The osage orange, "bowdarc," hedge apple or mock orange, is found in the eastern part of the State. It has been planted considerably as a hedge fence. Occasionally it reaches a height of 60 feet and a diameter of 30 inches, but more usually it is found from 20 to 40 feet in height and from 4 to 12 inches in diameter. This tree is sometimes used for shade, but mostly for hedges and as living fence posts. The BARK is thin, gray, sometimes tinged with yellow, and on old trees divided into strips or flakes. It contains tannin and has been used for tanning leather.



OSAGE ORANGE
Leaf and Fruit, one-quarter natural size. Twig, two-thirds natural size.

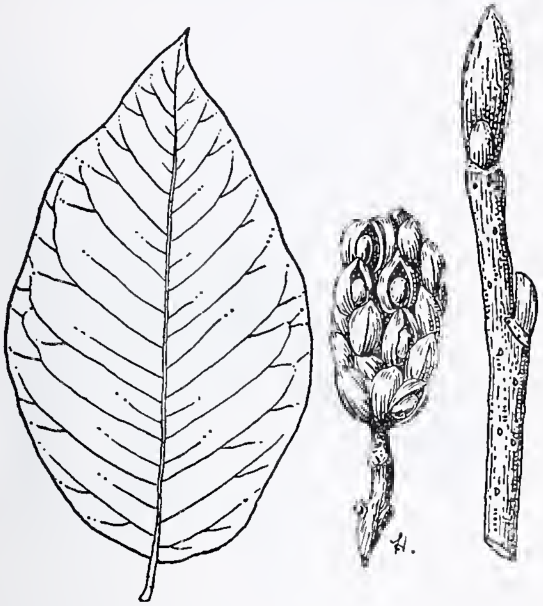
The LEAVES are simple, alternate, oval-pointed and lustrous green on the upper surface, 3 to 5 inches long and 2 to 3 inches wide, and turn bright yellow in the autumn.

The yellowish FLOWERS appear in May. They are of two kinds on the same tree—the male flowers in a linear cluster and the female flowers a rounded ball. The FRUIT is globular, from 2 to 5 inches in diameter, somewhat resembling a very rough green orange.

The WOOD is heavy, exceedingly hard, very strong and very durable in contact with the soil. The heartwood is bright orange in color, turning brown upon exposure. It is largely used for posts; sometimes for wheel-stock, lumber and fuel. The Indians prized the wood for bows and war clubs. It is the source of a dye used to make cloth a khaki color.

CUCUMBER TREE (*Magnolia acuminata* L.)

The cucumber tree attains an average height of 40 to 80 feet and a diameter of 1 to 2 feet. It occurs singly among other hardwood trees on the cooler north slopes and coves of Rich Mountain and on the southeast end of the Kiamichi Mountains in southeastern Oklahoma.



CUCUMBER TREE

Leaf, one-third natural size. Twig, two-thirds natural size.

The BARK is aromatic and bitter; that of the young twigs is a lustrous red-brown, while the bark of the trunk is rather thin, dark brown, furrowed and broken into thin scales.

The LEAVES are alternate, oblong, short-pointed, rounded at the base, silky hairy when unfolding, later smooth or slightly silky, 6 to 10 inches long, 4 to 6 inches wide, often with wavy edges, dark green above, lighter beneath.

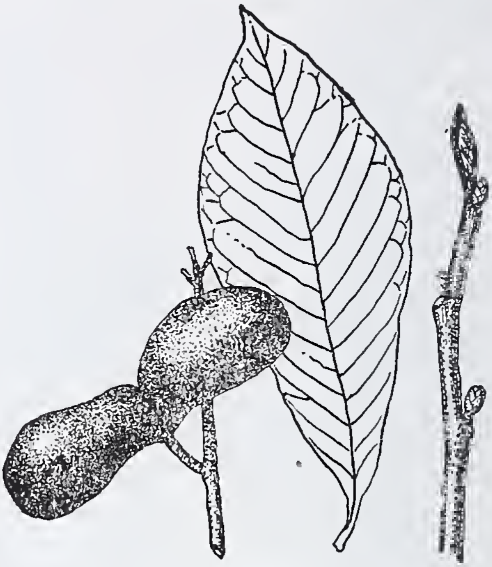
The FLOWERS are single, large—though smaller than those of the other magnolias—2½ to 3 inches long. The six upright petals are whitish-green tinged with yellow. The FRUIT is a smooth, dark red, often crooked "cone," 2½ to 3 inches long, somewhat resembling, when green, a small cucumber. The seeds are one-half inch long, and covered with a pulpy scarlet coat, which attracts the birds, particularly as the seeds hang by thin cords from the opening "cones."

The WOOD is light, soft, close-grained, durable, of a light yellow-brown color. It is quite desirable for ornamental planting. The evergreen **Magnolia grandiflora** L. is frequently cultivated, but is not native.

PAWPAW

(*Asimina triloba* [L.] Dunal.)

The pawpaw, which grows as a small tree or large shrub, is found in the eastern part of the State. Most commonly it occurs as an undergrowth in the shade of larger trees, on limestone or very rich alluvial soils. When growing alone, however, it forms a pryamid-shaped top. The BARK is thin, dark grayish-brown and smooth or slightly fissured on old trees.



PAWPAW

Leaf, one-quarter natural size. Twig, two-thirds natural size.

The LEAVES are alternate on the stem, pear-shaped, with pointed ends and tapering bases, smooth and light green above, from 8 to 10 inches long, and clustered toward the ends of the branches.

The dark-purple, attractive FLOWERS appear with the leaves singly or in twos along the branch, measure nearly 2 inches across, and produce nectar which attracts the bees.

When thoroughly ripe, the FRUIT on some trees is delicious and nutritious. It measures from 3 to 5 inches in length, turns from greenish-yellow to very dark brown in color, and holds rounded or elongated seeds which separate readily from the pulp or aril.

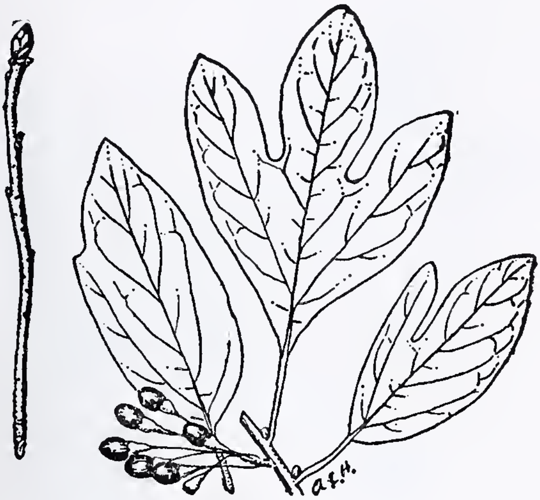
The WOOD is light, soft or spongy, and weak, greenish to yellow in color, and of no commercial importance.

Because of its handsome foliage, attractive flowers and curious fruit, the pawpaw has been much used in ornamental planting.

SASSAFRAS

(*Sassafras varifolium* [Sal.] Kun.)

The sassafras is a small, aromatic tree, usually not over 40 feet in height or a foot in diameter. It is found in the eastern part of the State on dry soils, and is one of the first broad-leaf trees to come up on abandoned fields, where the seeds are dropped by birds. It is closely related to the camphor tree of Japan. The BARK of the trunk is thick, red-brown and deeply furrowed and that of the twigs is bright green.



SASSAFRAS

Twig, one-half natural size. Leaf, one-third natural size.

The LEAVES are very characteristic. It is one of the few trees having leaves of widely different shape on the same tree, or even on the same twig. Some are oval and entire, 4 to 6 inches long; others have one lobe, resembling the thumb on a mitten; while still others are divided at the outer end into three distinct lobes. The young leaves and twigs are quite mucilaginous.

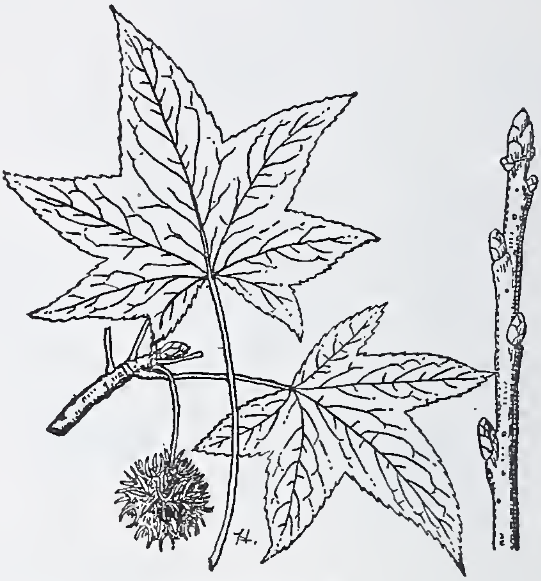
The FLOWERS are clustered, greenish-yellow, and open with the first unfolding of the leaves. The male and female flowers are usually on different trees. The FRUIT is an oblong, dark blue or black, lustrous berry, containing one seed and surrounded at the base by what appears to be a small orange-red or scarlet cup at the end of a scarlet stalk.

The WOOD is light, soft, weak, brittle and durable in the soil; the heartwood is dull orange-brown. It is used for posts, rails, boat-building, cooperage and for ox-yokes. The bark of the roots yields the very aromatic oil of sassafras much used for flavoring candies and various commercial products.

SWEET GUM (RED GUM)

(Liquidambar styraciflua L.)

The sweet gum is a large valuable forest tree. It occurs on rich river bottoms and in swamps subject to frequent overflow, as well as on drier uplands along streams in the eastern part of the State. It is usually abundant in second growth on old fields and in cut-over woods. The BARK is a light gray, roughened by corky scales, later becoming deeply furrowed. After the second year the twigs often develop 2 to 4 corky projections of the bark, which give them a winged appearance. The simple, alternate star-shaped LEAF, with its 5 to 7 points or lobes, is 5 to 7 inches across and very aromatic. In the fall its coloring is brilliant, ranging from pale yellow through orange and red to a deep bronze.



SWEET GUM

Leaf, one-third natural size. Twig, two-thirds natural size.

The FLOWERS are of two kinds on the same tree, unfolding with the leaves. The FRUIT at first glance reminds one of the balls of the sycamore, but on closer inspection proves to be a head. It measures an inch or more in diameter and is made up of many capsules with projecting spines. It frequently hangs on the tree by its long swinging stem late into the winter.

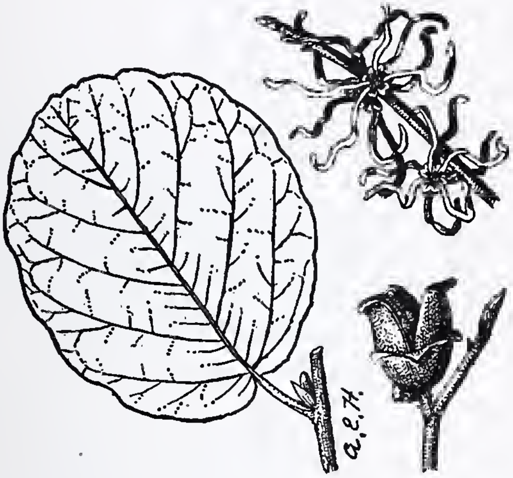
The WOOD is heavy, moderately hard, close-grained and not durable on exposure. The reddish-brown heartwood which suggests the name red gum, is not present to any appreciable extent in logs under 16 inches in diameter. The wood is extensively used for flooring, interior finish, paper pulp and veneers for baskets of all kinds. Veneers of the heartwood are largely used in furniture, sometimes as imitation mahogany or circassian walnut.

This tree should be more widely planted for ornamental use.

WITCH HAZEL

(*Hamamelis macrophylla* Pursh.)

The southern witch hazel is a small tree or shrub found in eastern Oklahoma. It sometimes gets to be 40 feet in height and a foot in diameter, although it is often a large shrub. Commonly many shoots are seen at the base of the tree. The northern witch hazel, which is a smaller tree, meets the range of this species in middle or southern Georgia and westward.



SOUTHERN WITCH HAZEL

Leaf, one-half natural size. Fruit, natural size.

The LEAVES are much rounded, unsymmetrical at the base, wavy on the margin, dark green above and paler below, and 3 to 5 inches long by 2 to 3 inches wide. They are hairy on both the upper and lower sides, and on the short leaf-stalks, and roughened by small swellings, or tubercules, at the bases of the hairs. The FLOWERS open in late autumn or winter (unlike most trees) and are borne in small clusters. Although small, they are conspicuous by the long, bright yellow, much twisted petals.

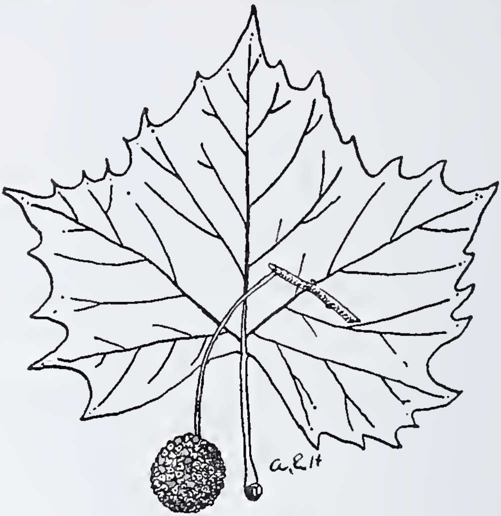
The FRUIT, a thick woody "pod," or capsule, with two curved beaks, is usually borne in pairs. It produces a single oblong hard brown seed.

The WOOD is very close-grained, heavy, hard, reddish-brown, with nearly white sapwood. From the bark and leaves of the northern witch hazel a distilled product is obtained largely used in fluid extract.

SYCAMORE

(Platanus occidentalis L.)

The sycamore, also called buttonwood, is considered the largest hardwood tree in North America. It occurs in the eastern half of the State and is most abundant and reaches its largest size along streams and on rich bottomlands. It is one of the more rapid-growing trees. It has been successfully planted on sub-irrigated soils in the northwestern part of the State where it has made rapid growth.



SYCAMORE

Twig, one-half natural size. Leaf and Fruit, one-third natural size.

The BARK of the sycamore is a characteristic feature. On the younger trunk and large limbs it is very smooth and greenish-gray in color. The outer bark yearly flakes off in large patches and exposes the nearly white younger bark. Near the base of old trees the bark becomes thick, dark brown and divided by deep furrows.

The LEAVES are simple, alternate, 6 to 7 inches long and about as broad, light green and smooth above, and paler below. The base of the leaf-stalk is hollow and in falling off exposes the winter bud. The FRUIT is a ball about 1 inch in diameter, conspicuous throughout the winter as it hangs on its flexible stem, which is 3 to 5 inches long. During early spring the fruit ball breaks up, and the small seeds or achenes are widely scattered by the wind.

The WOOD is hard and moderately strong, but decays rapidly in the ground. It is used for butchers' blocks, tobacco boxes, furniture and interior finish.

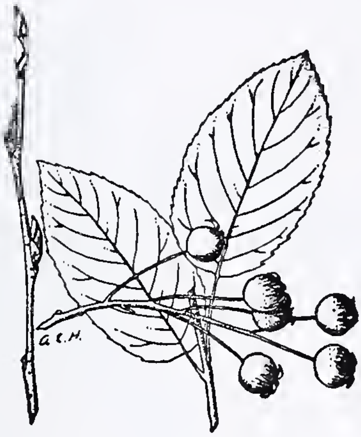
The European sycamore, or planetree, is less subject to disease than our species and has been widely planted in this country for ornament and shade.

Platanus occidentalis glabrata (Fern.) Sarg., and *Platanus occidentalis attenuata* Sarg., varieties separated from the type by variation in shape of their leaves are reported from eastern Oklahoma.

SERVICE-BERRY OR SERVICE-TREE

(*Amelanchier canadensis* [L.] Medic.)

The service-tree, also known as service-berry and locally as "sarvis," is found in the eastern part of the State and attains its best development on the mountain slopes. It is a small tree, 20 to 50 feet high and 6 to 18 inches in diameter, with a rather narrow, rounded top, but is often little more than a shrub. The BARK is thin, ashy gray, smooth on the branches and upper part of the stem, and breaking into shallow fissures on the short trunk.



SERVICE-BERRY OR SERVICE-TREE
One-half natural size

The LEAVES are alternate, slender-stalked, ovate, pointed, finely toothed, 2 to 4 inches long, purplish-brown until nearly mature, then becoming a light green and early covered with scattered silky hairs.

The white FLOWERS appear in erect or drooping clusters in early spring, before or with the leaves, making the tree quite conspicuous in the leafless or budding forest.

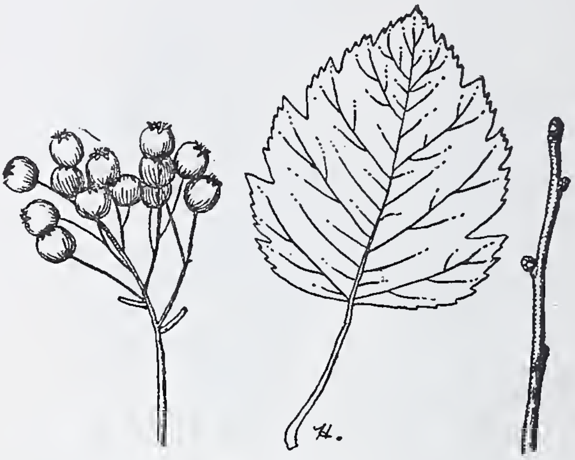
The FRUIT is rounded, dark purple when ripe, one-third to one-half an inch in diameter, ripening in May or June. Birds and other denizens of the forest are very fond of the fruit, and men have been known to cut down and destroy the trees to gather one good crop of fruit.

The WOOD is heavy, exceedingly hard, strong, close-grained and dark brown. It is occasionally used for handles. This is a desirable ornamental tree and should be planted for this purpose and to encourage the birds.

HAWTHORN (Haw, Thorn Bush)

(Crataegus invisa Sarg.)

This haw is found in the southeastern part of the State. It occurs in shady woods and grows to be a small tree, sometimes as large as 30 feet in height. The trunk is covered with small brown scales, and the branchlets occasionally are armed with sharp reddish-brown spines about an inch long.



HAWTHORN
Two-thirds natural size

The LEAVES are generally rounded, pointed, coarsely toothed and often doubly toothed (fine teeth on the margins of larger teeth). The leaves are occasionally partly cleft or divided. They are hairy below and smooth above, thin and of a yellow-green color, and from 2 to 3 inches long and about one inch narrower in width.

The FLOWERS, opening about the end of March, are in clusters (corymbs) of seven to twelve, each flower measuring about three-fourths inch across. Each has 20 stamens and there are long white hairs.

The FRUIT, or "apple," is orange red, about one-fifth inch in diameter, with a thin mealy flesh and contains from three to five seeds.

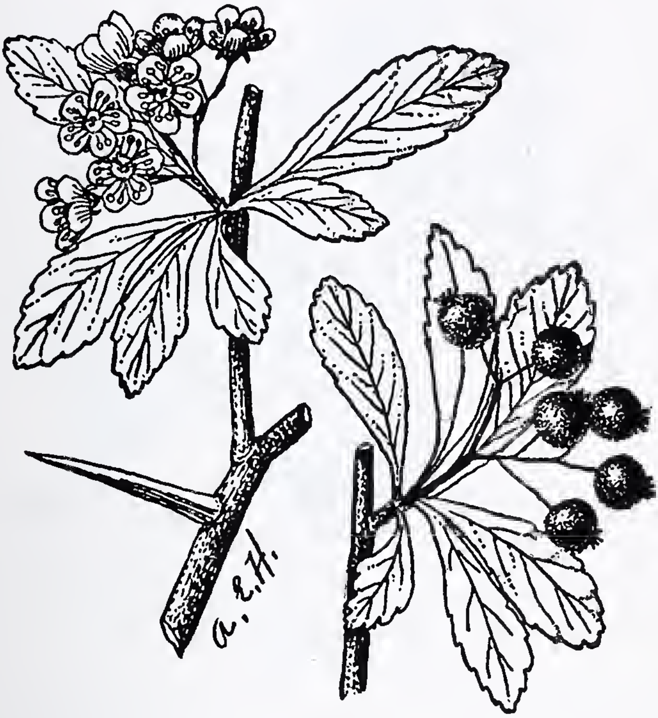
The WOOD has little, if any, value. All of the haws belong to the rose family of plants.

HAWTHORN (HAW, THORN BUSH)

(*Crataegus spathulata* Michx.)

This species of haw occurs in several southeastern counties. It reaches the size of a small tree, but often is only a shrub or bush, and prefers rich and moist soils along streams.

The stems have occasional sharp spines about an inch long. The bush or tree is rather spreading in form.



HAWTHORN
Natural size

The LEAVES are 3-lobed and each lobe is toothed and wavy on the margin. Some leaves are deeply lobed. They are rather thick, dark green, smooth and 1 to 2 inches long by 1 inch wide.

The FLOWERS open from March to May in clusters or corymbs, consisting usually of 8 to 12 flowers. Each flower is borne on a separate stem making up the cluster, has 20 stamens with rose-colored or yellow tips (anthers) and is about one-half inch in diameter.

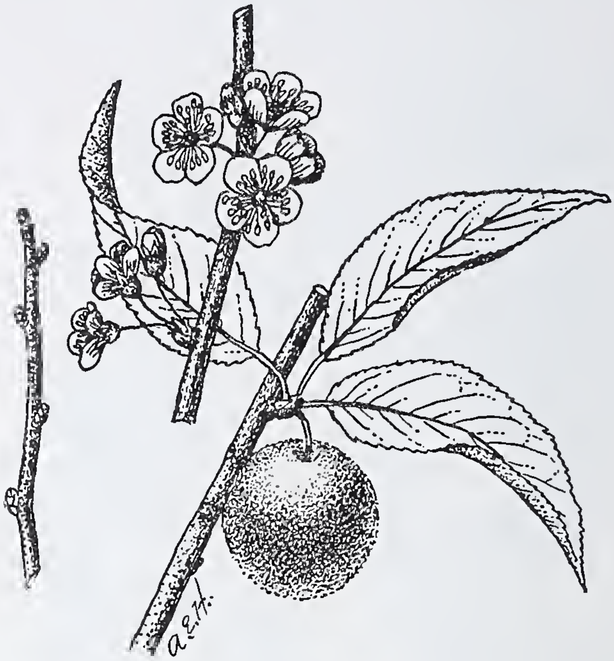
The FRUIT is nearly round, scarlet and contains from 2 to 5 seeds (nutlets).

This species of haw is widely distributed, as it is found from North Carolina, Georgia, Florida, Alabama, Mississippi, Missouri, Arkansas and eastern Texas.

CHICKASAW PLUM

(*Prunus angustifolia* Marsh.)

The chickasaw plum has spread widely over the southern states until it is now doubtful where its original home was located. A small tree or often a dense thicket of shrubs, this plum usually is found on a better class of soils than some of the other plums.



CHICKASAW PLUM
Natural size

Good varieties have been selected and planted because of the value of the plums for food.

The LEAVES are comparatively narrow, as the botanical name implies, pointed at both ends, sharply toothed, smooth, shiny, bright green and from 1 to 2 inches long and one-half inch wide. The leaf stems, or petioles, are bright red.

The small FLOWERS appear in March before the leaves, in clusters or umbels of two to four each and white or yellowish-white. The plums are among our most attractive and showy native trees at blossoming time.

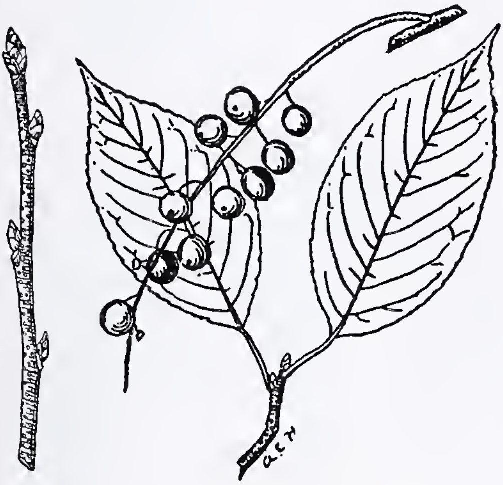
The FRUIT is nearly round, about one-half inch in diameter, bright red or yellow, smooth and shiny, and ripens in mid-summer. The small wrinkled "pit" or hard-shelled seed, is surrounded by a thin layer of somewhat acid flesh.

Although the WOOD is rather heavy, it is not strong and medium soft, light brownish-red in color.

BLACK CHERRY (WILD CHERRY)

(*Prunus serotina* Erh.)

A medium-sized tree, up to about 70 feet high and 1 to 3 feet in diameter, black cherry occurs usually on rich loams. The forest-grown trees have long clear trunks with little taper; open-grown trees have spreading crowns. The BARK on branches and young trunks is smooth and bright reddish-brown, marked by conspicuous, narrow, white, horizontal lines, and has a bitter-almond taste. On the older trunks the bark becomes rough and broken into thick, irregular plates.



BLACK CHERRY

Twig, two-thirds natural size. Leaf, one-third natural size.

The LEAVES are alternate, simple, oval to lance-like in shape, with edges broken by many fine incurved teeth, thick and shiny above, and paler beneath.

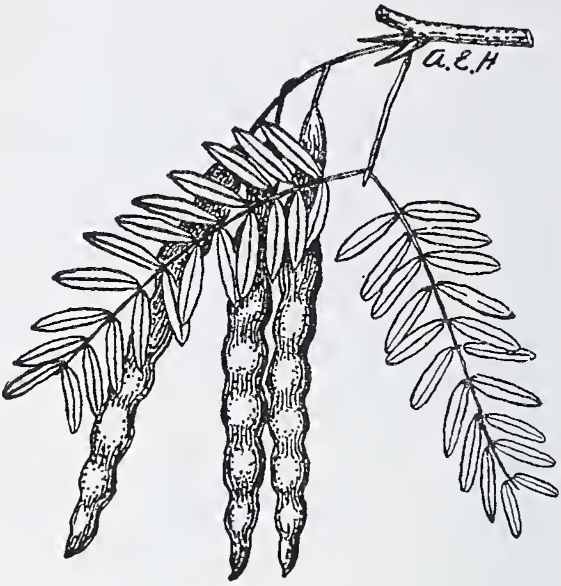
The FRUIT is dull purplish-black, about as large as a pea, and is borne in long hanging clusters. It ripens in late summer, and is edible, although it has a slightly bitter taste.

The WOOD is reddish-brown with yellowish sapwood, moderately heavy, hard, strong, fine-grained and does not warp or split in seasoning. It is valuable for its luster and color and is used for furniture, interior finish, tools and implement handles. With the exception of black walnut, the cherry lumber has a greater unit value than any other hardwood of the eastern United States.

MESQUITE

(*Prosopis juliflora glandulosa* [Torrey] Cook.)

This well-known small tree of the dry regions of the Southwest is found in the western and south central parts of the State. The short trunk, usually only 6 to 8 inches in diameter, divides into many branches forming a loose, open top or crown.



MESQUITE

Leaf, one-fourth natural size. Fruit, one-half natural size.

The ROOT system is very large, consisting of a thick taproot sometimes extending downward to a depth of 30 to 40 feet, with many radiating roots spreading horizontally in different directions.

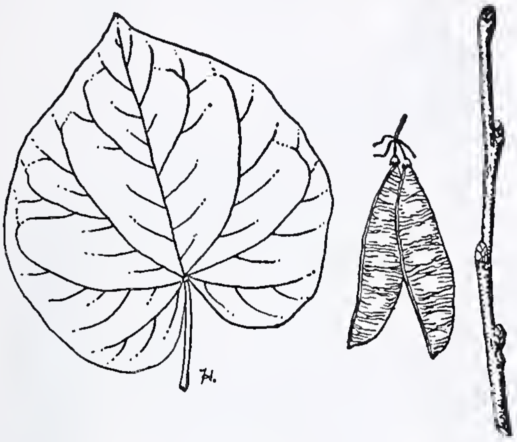
The LEAVES are compound with two and sometimes four pinnae, each made up of 12 to 20 leaflets attached along a central midrib, or "stem," from 8 to 10 inches long. The leaflets are smooth, dark green and pointed, often 2 inches long. Near their bases are small spines.

The FLOWERS are tiny and in clusters (spikes) from 2 to 4 inches long. They are fragrant and yield nectar that is sought by the bees. The FRUIT is a pod about 4 to 9 inches long and narrowed between each of the 10 to 20 seeds, enclosed in a thick sweet pulp and used by the natives as food. It is also eagerly sought by wild life and livestock.

The WOOD is heavy, hard and dark reddish-brown in color. It is much used for fuel and, because it is very durable in the ground, for fence posts.

RED BUD *(Cercis canadensis* L.)

The redbud, sometimes called judas-tree from its oriental relative of that name, is a small tree occurring under taller trees or on the borders of fields, on hillsides or in valleys throughout the State as far west as Woodward County. It ordinarily attains a height of 25 to 50 feet and a diameter of 6 to 12 inches. Its stout branches usually form a wide flat head.



REDBUD

Leaf, one-third natural size.

Twig, two-thirds natural size.

The BARK is bright red-brown, the long narrow plates separating into thin scales.

The LEAVES are alternate, heart-shaped, entire, 3 to 5 inches long and wide, glossy green turning in autumn to a bright clear yellow.

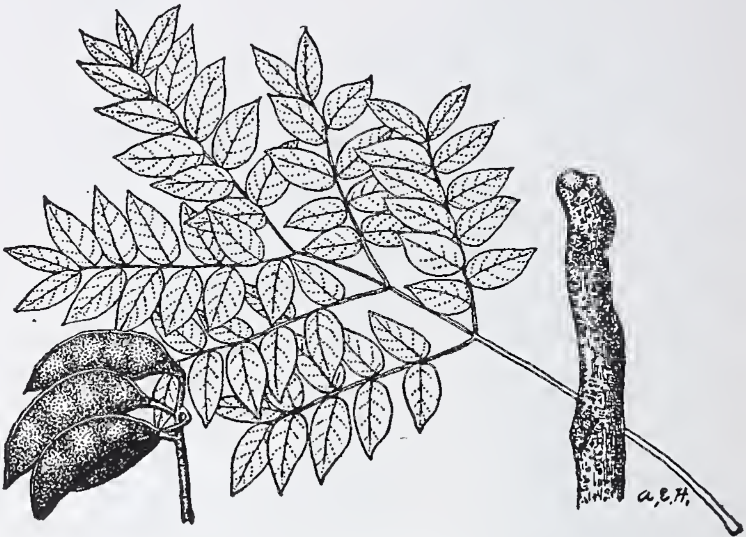
The conspicuous, bright purplish-red, pea-shaped FLOWERS are in numerous clusters along the twigs and small branches and appear before or with the leaves in early spring. With the redbud in its full glory, a drive through the country is likely to be one long remembered.

The FRUIT is an oblong, flattened, many-seeded pod, 2 to 4 inches long, reddish during the summer and often hanging on the tree most of the winter.

The WOOD is heavy, hard, not strong, rich dark brown in color and of little commercial importance. The redbud is cultivated as an ornamental tree and for that purpose might be planted more generally in this State.

COFFEE TREE (COFFEE BEAN)
(*Gymnocladus dioicus* [L.] Koch.)

This tree, a member of the pea or bean family (legumes) rises with a straight shaft and, in the open, is topped with a wide-spreading noticeably light or airy crown made up of graceful foliage evenly distributed. It is found along streams and on low lands throughout the State. Because its seeds in early days were to some extent used as a substitute for coffee, it has become widely known by its present common name.



COFFEE TREE
Leaf and Fruit, one-eighth natural size. Twig, one-half natural size.

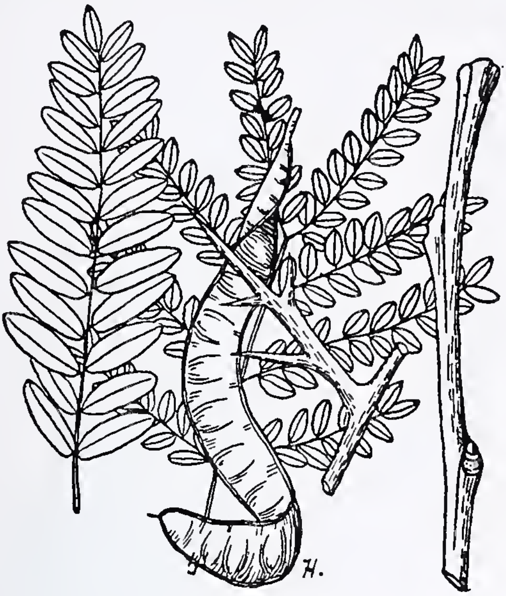
The BARK is relatively thin, fissured, dark gray tinged with red and roughened by numerous small scales.

The LEAVES are alternate, doubly compounded with 5 to 9 pinnae (pairs of leaf branches) each having 6 to 14 smooth leaflets, generally ovate in shape. The complete leaf, including the stem, measures from 1 to 3 feet in length by 18 to 24 inches in width. The small FLOWERS are borne in clusters, and each individual tree bears only male or female flowers, as the case may be. The FRUIT is a pod, borne several in a cluster. The pods measure from 4 to 10 inches in length, remain closed through the winter and contain seeds about three-quarters of an inch across, separated by a thick layer of sweet pulp.

The WOOD is heavy, strong, coarse-grained and durable in contact with the soil. It is occasionally used for cabinet work, and for posts and in general construction.

HONEY LOCUST *(Gleditsia triacanthos* L.)

The honey locust occurs in the eastern part of the State and has been successfully planted on sub-irrigated soils in the western part. It grows under a wide variety of soil and moisture conditions. It sometimes occurs in the forest, but more commonly in corners and waste places beside roads and fields. It reaches a diameter of 30 inches and a height of 75 feet. The BARK on old trees is dark gray and is divided into thin tight scales. The strong thorns—straight, brown, branched, sharp and shiny which grow on the 1-year-old wood and remain for many years—are sufficient to identify the honey locust.



HONEY LOCUST

Leaf, one-quarter natural size. Twig, three-quarters natural size.

The LEAF is pinnate or feather-like, with 18 to 28 leaflets; or it is twice-pinnate, consisting of 4 to 7 pairs of pinnae or secondary leaflets, each 6 to 8 inches long and somewhat resembling the leaf of the black locust.

The FRUIT is a pod, 10 to 18 inches long, often twisted, 1 to 1½ inches wide, flat, dark brown or black when ripe and containing yellow sweetish pulp and seeds. The seeds are very hard and each is separated from the others by the pulp. The pods are eaten by many animals, and as the seeds are hard to digest, many are thus widely scattered from the parent tree.

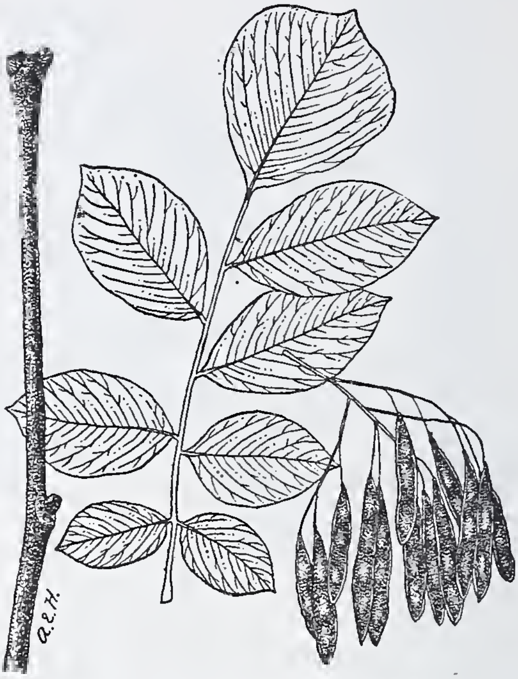
The WOOD is coarse-grained, hard, strong and moderately durable in contact with the ground. It is used for fence posts and crossties. It should not be confused with the very durable wood of the black locust.

Gleditsia triacanthos inermis Wild., a variety without thorns, is occasionally found.

YELLOW WOOD (Gopher Wood)

(*Cladrastis lutea* [Michaux] K. Koch.)

The yellow wood, also called the gopher wood, is one of the rarest and most beautiful trees of the American forest. It is found in Oklahoma in the northeastern part of the State.



YELLOW WOOD

Twig, two-thirds natural size. Leaf and Fruit, one-fourth natural size.

This tree may be from 50 to 60 feet in height and 1 or 2 feet in diameter. It is commonly found along the banks of ravines.

The BARK is thin, smooth, grayish and resembles that of the beech, while the roots are a deep yellow in color.

The LEAVES are compound, odd pinnate, with some leaflets placed opposite to each other and others alternate. The buds are small and formed within the base of the leaf-stalk.

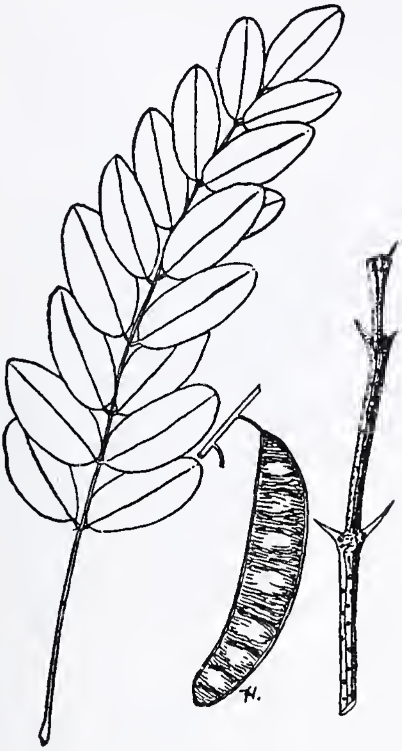
The FLOWERS are white, like those of the locust, to which family it belongs and the FRUIT is naturally a legume or pod, splitting and discharging a few oblong, compressed seeds. Pods are not produced every year.

The WOOD is rather light, weighing 30 pounds to the cubic foot, hard and strong. The heartwood is a clear yellow color when freshly cut, soon changing to brownish, and the thin sapwood is nearly white. A yellow dye is made from the heartwood.

BLACK LOCUST (YELLOW LOCUST)

(Robinia pseudoacacia L.)

The black locust occurs in the eastern part of the State and has been extensively planted nearly all over the State. It is severely attacked by the locust borer which has destroyed large numbers of the trees. The twigs and branchlets are armed with paired straight or slightly curved sharp, strong spines, sometimes as much as 1 inch in length which remain attached to the outer bark for many years. The BARK is dark brown and divides into strips as the tree grows older.



BLACK LOCUST
Leaf and Fruit, one-third natural size. Twig, two-thirds natural size.

The LEAVES are pinnate, or feather-like, from 6 to 10 inches in length, consisting of from 7 to 19 oblong thin leaflets.

The FLOWERS are fragrant, white or cream-colored and appear in graceful pendant racemes.

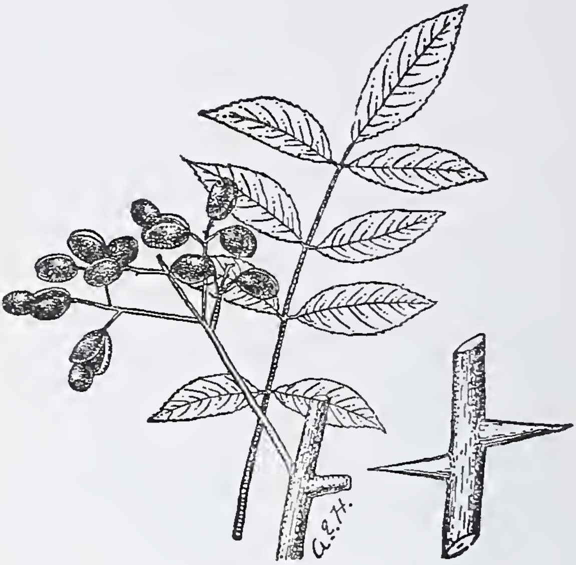
The FRUIT is a pod from 3 to 5 inches long containing 4 to 8 small hard seeds which ripen late in the fall. The pod splits open during the winter, discharging the seeds. Some seeds usually remain attached to each half of the pod, and this acts as a wing upon which the seeds are borne to considerable distance before the strong spring winds.

The WOOD is yellow in color, coarse-grained, very heavy, very hard, strong and very durable in contact with the soil. It is used extensively for fence posts, poles, tree nails, insulator pins and occasionally for lumber and fuel.

PRICKLY ASH (Toothache Tree)

(Xanthoxylum clava-herculis L.)

The prickly ash, or toothache tree, is restricted to the lowlands of the eastern part of the State. It is a very spiny round-headed tree or shrub, becoming 30 feet high or more, with a short trunk 12 to 16 inches in diameter.



PRICKLY ASH

Leaf, one-third natural size. Fruit and Twig, three-quarters natural size.

The BARK, which is light gray and very thin, is roughened by corky tubercles surrounding the prickles. The tubercles are sometimes nearly an inch across and rounded at the apex. The bark is gathered for its medicinal qualities, being used for toothache and rheumatism. The twigs are brown-hairy at first, becoming smooth, gray and bearing broad-based prickles over a half inch long.

The LEAVES are compound composed of 7 to 17 leaflets on a prickly leaf-stem. The leaflets are oblique at the base, toothed and pointed, 1 to 2½ inches long, lustrous green above, paler and sometimes hairy below, falling in late winter or spring.

The FLOWERS are of two kinds on different trees, in branched clusters, appearing in spring when the leaves are half grown. The FRUIT is borne in dense nearly globose clusters, ripening in May or June. It is a one-seeded, chestnut-brown capsule one-quarter inch long, with a rough surface. The seeds are black and shining.

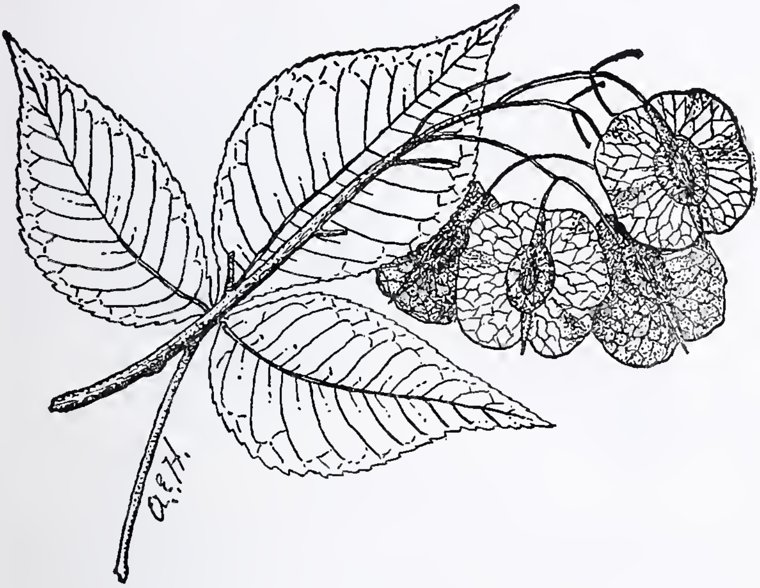
The WOOD is of light weight, soft, close-grained and light brown, with yellow sapwood.

HOPTREE (WAFER ASH)

(*Ptelea trifoliata* L.)

This small tree or large shrub, depending upon where the plant grows, is found scattered over the State. The bark and leaves are bitter and strong-scented and possess tonic qualities.

The hoptree has a straight, slender trunk, 6 to 8 inches in diameter and seldom reaches a height of more than 20 feet.



HOPTREE
Three-fourths natural size

The LEAVES are composed of three leaflets, sometimes five, each of which is oval, or pear-shaped and pointed, about 4 to 6 inches in length by 2 to 3 inches wide, and dark green on the upper surface. The central leaflet is the largest.

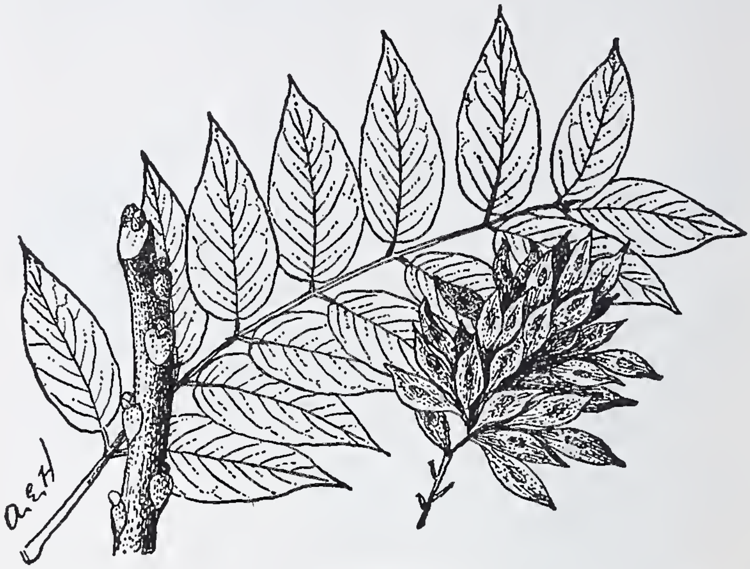
The FRUIT consists of a small, round, 2-seeded winged "key" or "samara," resembling somewhat the familiar paper caps for toy pistols. They occur in dense drooping clusters and hang on the tree over winter.

The WOOD is heavy, hard, yellowish-brown and close-grained. The bitter bark of the roots is sometimes used as a tonic.

AILANTHUS (TREE OF HEAVEN)

(*Ailanthus altissima* Swing.)

This native tree of China has become widely naturalized over the United States. It grows rapidly and withstands dry conditions, often being found in waste places. Because of its vigor, it is sometimes planted for shade where no other tree can thrive. In good locations it reaches a height of 40 to 60 feet.



AILANTHUS
Leaf, one-eighth natural size. Fruit and Twig, one-third natural size.

The compound LEAVES, from 1 to 3 feet long, have from 15 to 41 leaflets each with smooth margins except for one or more notches near the bases, pointed, and from 3 to 5 inches in length. The resemblance of the leaves is strong to our native sumacs.

The FLOWERS are of one sex each borne on separate trees, known by the botanists as **dioecious**. This is like our native willows, cottonwoods, holly, persimmon and others. The ill-scented male flowers make this form of the tree objectionable for planting or cultivation. The female flowers have little odor. They are in smaller clusters than those of the male kind which are in dense compound clusters.

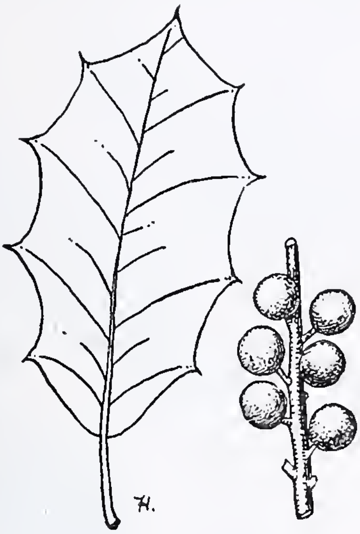
The FRUIT consists of a flat, thin, twisted wing from 1 to 2 inches long, bearing near the center a single seed. The red and green color of the fruit clusters, which stay on the tree over winter, make the female tree desirable for ornamental use. However, because of an abundance of seeds and an ability to sucker freely the ailanthus sometimes becomes a weed-like tree pest.

The WOOD is soft, very weak and light and has no use in this country. Because the wood is well adapted for certain kinds of paper pulp, there has been some consideration of planting it on a commercial scale.

HOLLY

(*Ilex opaca* Ait.)

The holly occurs in the southeastern part of the State. It prefers a rich moist soil, but is also found on the higher and drier situations. It is much less abundant now than formerly, due to the large amount gathered and shipped to the cities for Christmas decorations, to clearing of bottomlands for farms and to cutting down of the trees so cattle could browse on the tops for winter feed.



HOLLY
Two-thirds natural size

It is an evergreen tree, occasionally 65 feet in height and 30 inches in diameter.

The BARK is light gray and roughened by wart-like growths. The numerous short, slender branches form a dense, narrow pyramidal head of striking dark green color effect, especially when well laden with the conspicuous red berries.

The LEAVES are simple, alternate, oval, thick and leathery, 2 to 4 inches long, and armed with spiny teeth; they persist on the branches for about three years, then they drop off in the spring.

The FLOWERS are small, whitish and inconspicuous; the male and female flowers are usually borne on separate trees.

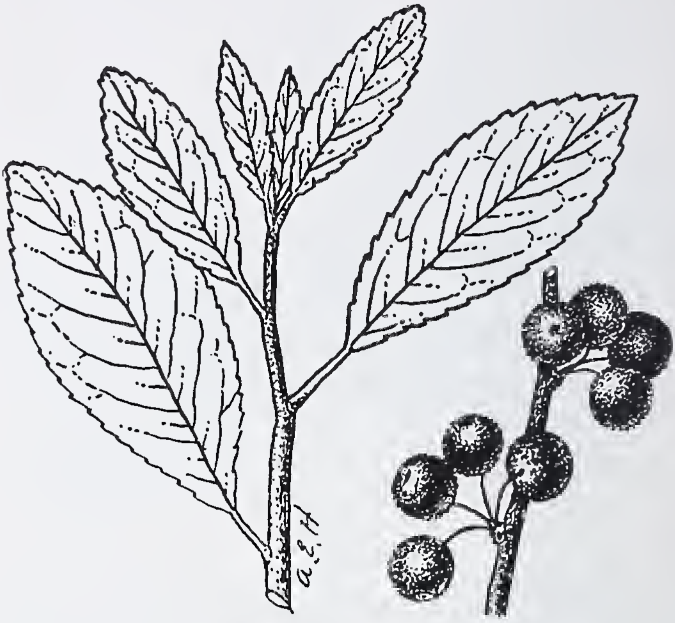
The FRUIT, which ripens late in the fall and persists on the branches over winter is a dull red or sometimes yellow, nearly round drupe, about one-quarter of an inch in diameter containing 4 to 6 ribbed nutlets.

The WOOD is light, tough, not strong and nearly white. It is valued and much used for cabinet work and wood-turning. For this purpose many of the larger, finer trees have been cut and marketed.

DECIDUOUS HOLLY (WINTERBERRY)

(*Ilex decidua* Walt.)

This ornamental tree of the holly family is found extensively over the South. A small tree in eastern Oklahoma and in adjacent parts of Missouri, Arkansas and Texas, it occurs only as a shrub east of the Mississippi River. It likes low moist soils.



DECIDUOUS HOLLY
Four-fifths natural size

The LEAVES mostly fall off at the end of the season. They occur in clusters at the ends of short branchlets or spurs. Each leaf is oblong, narrower toward the base, slightly toothed or wavy on the margin, and from 2 to 3 inches long by one-half to one inch wide.

The small FLOWERS are of one sex only, as with all the species of holly, each kind is borne separately on different trees. The male flowers are on slender flower stems (pedicels), often only half an inch long. The female flowers are on shorter stems, singly or in small clusters, or cymes, on branchlets that formed the year before.

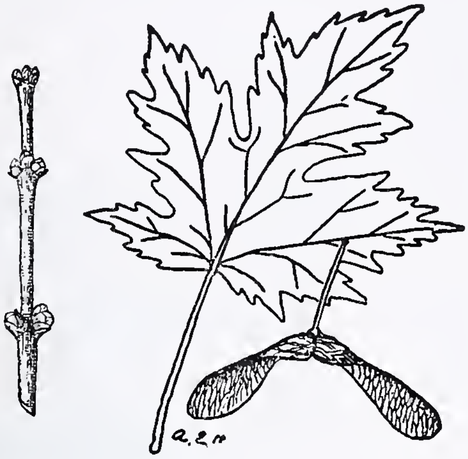
The FRUIT, which ripens in the fall, hangs in clusters over winter, and the clusters of orange and scarlet "berries" account for the popularity of this tree or shrub in winter, especially at Christmas time.

The WOOD is nearly white, close-grained, heavy and hard. The sapwood is hardly distinguishable.

SUGAR MAPLE

(*Acer saccharum* Marsh.)

The sugar maple, often called sugar tree, is found on cool slopes, usually in limestone soil in the southeastern and northeastern parts of the State and in the deeper canyons in Caddo County. It has a very symmetrical, dense crown, affording heavy shade. The BARK on young trees is light gray to brown and rather smooth, but as the tree grows older it breaks up into long, irregular plates or scales, which vary from gray to almost black. The twigs are smooth and reddish-brown, and the winter buds sharp-pointed. The tree attains a height of more than 80 feet and a diameter of 2 feet or more. The sap yields maple sugar and maple syrup.



SUGAR MAPLE

Leaf, one-third natural size. Twig, one-half natural size.

The LEAVES are 3 to 5 inches across, simple, opposite, with 3 to 5-pointed and sparsely toothed lobes, the divisions between the lobes being rounded. The leaves are dark green on the upper surface, lighter green beneath, turning in autumn to brilliant shades of dark red, scarlet, orange and clear yellow.

The FLOWERS are yellowish-green, on long thread-like stalks, appearing with the leaves, the two kinds in separate clusters. The FRUIT, which ripens in the fall, consists of a two-winged "samara," or "key," the two slightly divergent wings about 1 inch in length and containing a seed and carried by the wind.

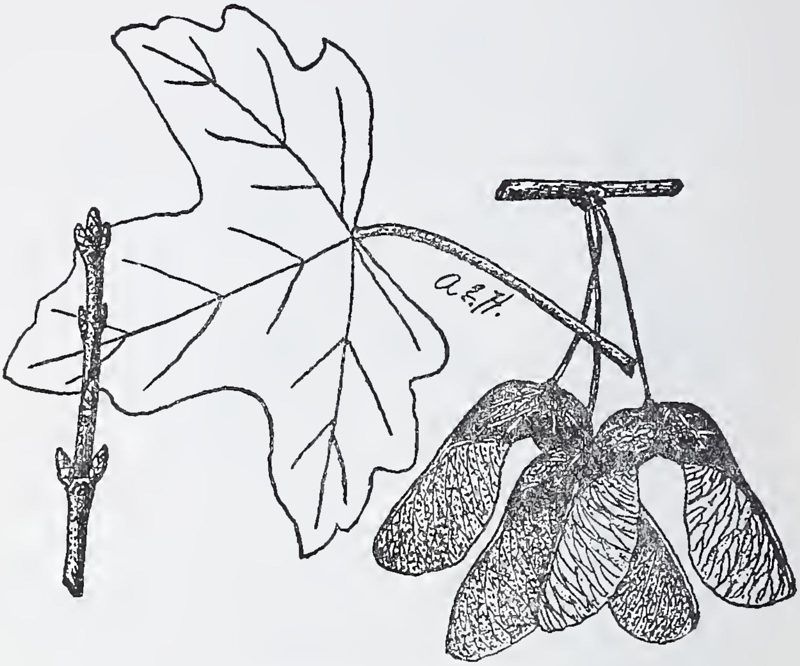
The WOOD is hard, heavy, strong, close-grained and light brown in color. It is known commercially as hard maple and is used in the manufacture of flooring, furniture, shoe-lasts and a great variety of novelties.

Acer saccharum glaucum Sarg., a variety having leather-like leaves, dark green on upper surface and pale green beneath, is found with the type.

BIGTOOTH MAPLE (Western Sugar Maple)

(*Acer grandidentatum* Nutt.)

The bigtooth maple or western sugar maple, finds its extreme eastern home in the Wichita Mountains in the southwestern part of the State. It extends from southern New Mexico and Arizona to northern Montana and Idaho. It grows in cool moist places and gets to be a small tree up to 30 feet in height and 8 to 10 inches in diameter, with generally upright rather than spreading branches. The bark is thin and dark brown.



WESTERN SUGAR MAPLE

Leaf, three-fourths natural size. Fruit and Twig, natural size.

The LEAVES are opposite, like all the maples, from 2 to 5 inches in diameter, divided into three lobes, each of which has a wavy margin, thick, dark green, shiny above but pale and fuzzy below. In autumn they turn scarlet or yellow.

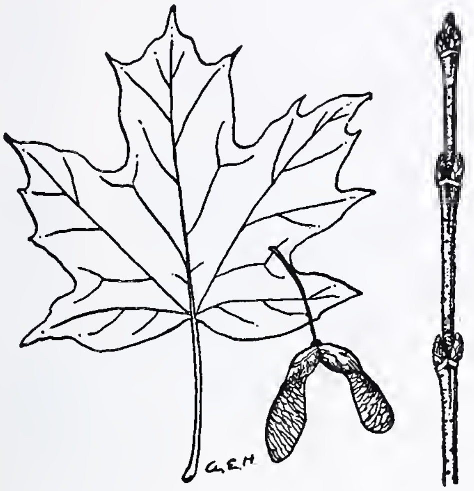
The FLOWERS, which are without petals and open in the spring along with the leaves, are small and borne on long slender stems or pedicels, in clusters of 4 to 8. There are two kinds, the male and female flowers, however, borne on the same tree.

The maple keys each have two spreading and erect wings, from one-half to one inch long, reddish until maturity in the fall when they are dark green. The seeds are about one-fourth inch long.

The WOOD is nearly white, hard, heavy and close-grained.

SILVER MAPLE *(Acer saccharinum* L.)

The silver or soft maple occurs rarely except on moist land and along streams in the eastern half of the State. It attains heights of 100 feet or more and diameters of 3 feet or over. It usually has a short trunk which divides into a number of large ascending limbs. These again subdivide, and the small branches droop but turn upward at the tips. The BARK on the old stems is dark gray and broken into long flakes or scales; on the young shoots, it is smooth and varies in color from reddish to a yellowish gray. The silver maple grows rapidly and has been much planted as a shade tree, but is less desirable than many other trees because of its brittleness and susceptibility to insects and fungus diseases.



SILVER MAPLE

Leaf, one-third natural size. Twig, one-half natural size.

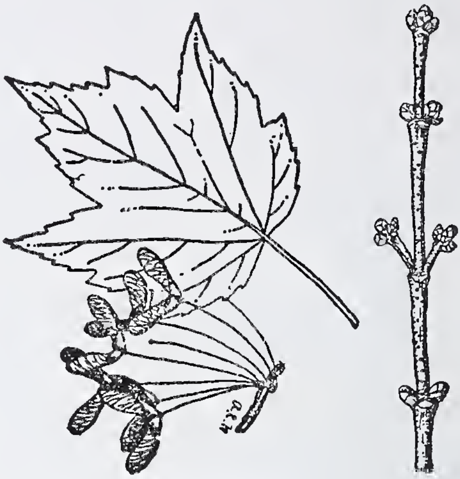
The LEAVES are opposite on the stem, have from 3 to 5 lobes ending in long points with toothed edges and are separated by deep angular sinuses or openings; they are pale green on the upper surface and silvery white underneath. The BUDS are rounded, red or reddish-brown, blunt-pointed; generally like those of red maple.

The FLOWERS appear in the spring before the leaves, in dense clusters, and are of a greenish-yellow color. The FRUIT ripens in late spring. It consists of a pair of winged seeds or "keys" with wings 1 to 2 inches long on slender, flexible, thread-like stems about an inch long.

The WOOD is soft, weak, even-textured, rather brittle, easily worked and decays readily when exposed. It is occasionally used for flooring, furniture and fuel.

RED MAPLE *(Acer rubrum* L.)

The red maple, or swamp maple, is found in the eastern and central parts of the State. It is usually a medium-sized tree, quick-growing and relatively short-lived. It is used as a shade tree, though much inferior for this purpose to the sugar maple. The BARK is smooth and light gray on young stems, and dark gray and rough on the old limbs and trunk.



RED MAPLE

Leaf, one-third natural size. Twig, one-half natural size.

The LEAVES are 2 to 5 inches long and have from 3 to 5 pointed, saw-toothed lobes, which are separated by sharp angular sinuses or openings. The upper surface, when mature, is light green and the lower surface whitish and partly covered with pale down. In autumn the leaves turn to brilliant shades of red, orange and yellow.

The red FLOWERS in dense clusters appear in early spring before the leaves, the buds turning a deep red sometimes before they open. The winter buds are small, red and round or blunt-pointed. The FRUIT ripens in late spring or early summer. It consists of pairs of winged seeds, or keys, one-half to one inch in length, on long drooping stems, red, reddish-brown or yellow in color.

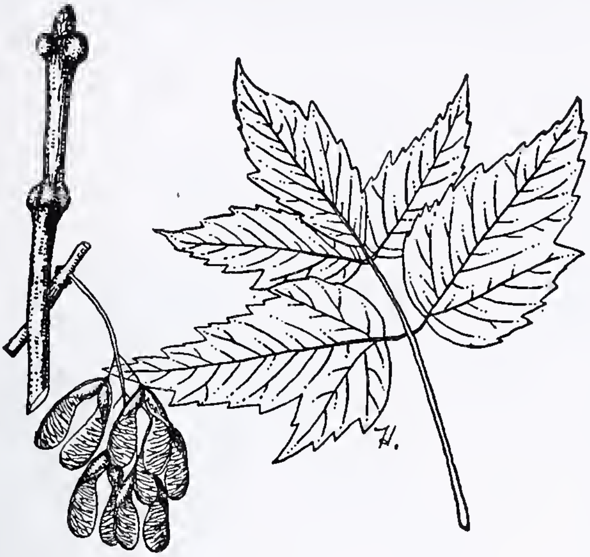
The WOOD, which is commercially known as soft maple, is heavy, close-grained, rather weak and of a light brown color. It is used in the manufacture of furniture and for turnery, woodenware and also for fuel.

Acer rubrum tomentosum Kirch., a variety with leaves densely tomentose on the under surface, is found in eastern Oklahoma.

Acer rubrum toidens Wood, a variety with leaves usually having a rounded base, three-lobed, remotely serrate with incurved glandular teeth, is found in eastern Oklahoma.

BOX ELDER *(Acer negundo* L.)

The box elder is a fairly rapid-growing tree, found in the eastern and southern parts of the State on alluvial soil. It is a tree of medium size, rarely reaching over 24 inches in diameter and 60 to 70 feet in height. It has been considerably planted for shade because in good soil its growth is rapid. Its limbs and branches, however, are fragile, and the tree as a whole is subject to disease and the depredations of insects. It is not long-lived or generally satisfactory for any purpose. It is prolific in reproduction but is largely destroyed by grazing and cultivation.



BOX ELDER
Twig, two-thirds natural size. Leaf, one-third natural size.

The BARK on young branches is smooth and green in color; on old trees it is thin, grayish to light brown and deeply divided.

The LEAVES are compound, with usually 3 leaflets (rarely 5 to 7), opposite, smooth and lustrous, green and borne on a leaf-stem or petiole 2 to 3 inches long. The leaflets are 2 to 4 inches long by 1 to 2 inches wide, making the whole leaf 5 to 8 inches in length.

The SEED is a samara, or key, winged similarly to that of a sugar maple, but smaller. It ripens in late summer or early fall, and so is like its close relatives, the sugar maple, but unlike its other close relatives, the red maple and silver maple.

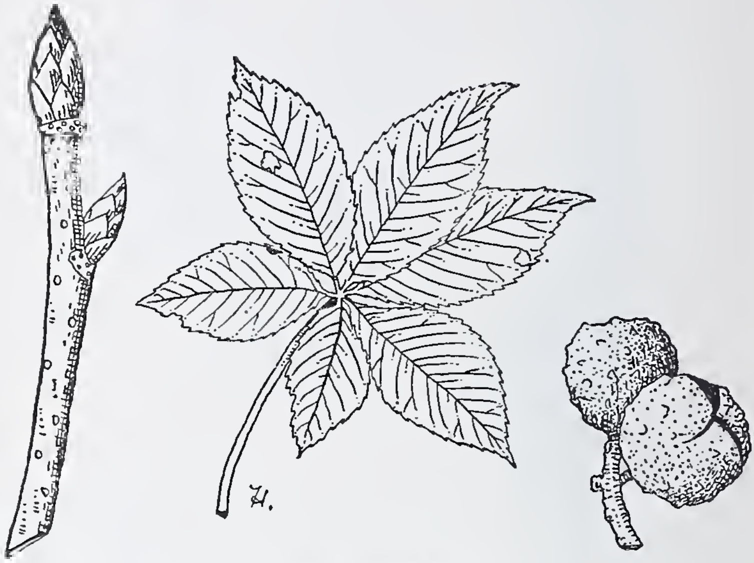
The WOOD is soft, light, weak, close-grained and decays readily in contact with heat and moisture. It is used occasionally for fuel.

Acer negundo texana Pax., a variety having a dense covering of pale hairs on the branchlets and, early in the season, on the midribs of the leaves, is found in southern Oklahoma.

OHIO BUCKEYE (Fetid Buckeye)

(*Aesculus glabra leucodermis* Sarg.)

The Ohio buckeye occurs along streams and in rich soil scattered through southern and eastern Oklahoma. Though it is often only a shrub it becomes a medium-sized tree in rich alluvial bottoms, but forms no considerable part of the forest stand. Its LEAVES and FRUIT are poisonous to stock. The crown, or head, is generally open and made up of small spreading branches and twigs orange-brown to reddish-brown in color. The BARK is light gray and, on old trees, divided or broken into flat scales, which make the stem of the tree rough; the bark is ill-smelling when bruised.



OHIO BUCKEYE
Twig, two-thirds natural size. Nut, one-third natural size.
Leaf, one-quarter natural size.

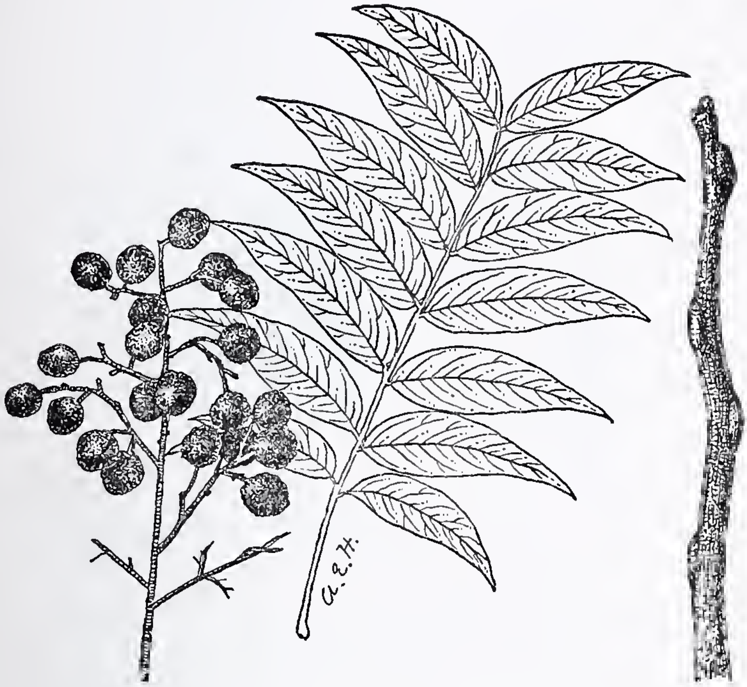
The LEAVES are compound or star-shaped, opposite on the stem, and generally like those of the yellow or sweet buckeye, though smaller and fetid or ill-smelling. They usually turn yellow in the summer and then fall off.

The FLOWERS are cream-colored and appear in clusters, 5 to 8 inches long in April or May. The FRUIT is regularly rounded, pale brown, generally thin-walled, roughened with blunt prickles or warts, and, breaking into 2 or 3 valves, discloses the bright, shiny mahogany colored seeds, or nuts.

The WOOD is light, soft and weak, and decays rapidly when exposed. It is used for woodenware, artificial limbs, paper pulp and for lumber and fuel.

WILD CHINA (Chinaberry, Soapberry)
(*Sapindus drummondii* Hook. and Arn.)

This species, sometimes called Indian soap plant, grows on moist clay soils or dry limestone uplands. It ranges through Oklahoma to New Mexico and Arizona, becoming a tree 40 to 50 feet high and 1 to 2 feet in diameter, with usually erect branches, and branchlets at first slightly many-angled.



WILD CHINA

Leaf, two-fifths natural size. Fruit, one-third natural size.

The BARK is broken by deep fissures into long narrow plates which in turn are broken on the surface into small red-brown scales.

The LEAVES, appearing in March or April, bear 4 to 9 pairs of alternate lance-shaped leaflets which are pale yellow-green, about 2½ inches long and one-half to two-thirds inch wide. The leaves fall in autumn or early winter.

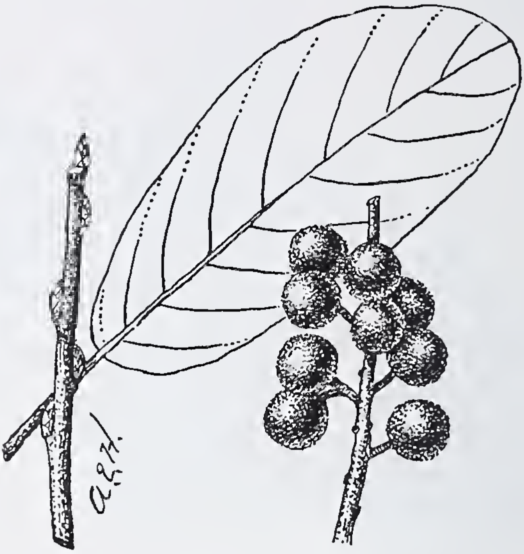
The FLOWERS are whitish, in large, dense clusters. The FRUIT, ripening in September and October, does not fall until spring; yellow with dark brown seeds.

The WOOD is heavy, strong, close-grained, light brown tinged with yellow. It splits easily into thin strips and is used for cotton baskets and the frames of pack-saddles.

INDIAN CHERRY

(*Rhamnus caroliniana* Walt.)

The Indian cherry, which, however, is not a true cherry, occurs over the southern United States, but reaches its largest size in the region where Oklahoma, Arkansas and Texas meet. It grows mostly in bottoms and along stream banks. At its best it is a small tree or large shrub. The BARK is pungent and irritating to the skin. The fruit and bark yield yellow or green dyes. There are two closely related species, both found in the Pacific Coast region, that reach the size of small trees. A European species is much used as a hedge in the Eastern States.



INDIAN CHERRY
Natural size

The LEAVES are alternate along the stem, oblong to elliptical in shape, pointed, very finely toothed or wavy along the margin, thin, yellowish to dark green above and lighter below, and in autumn yellow. They are from 2 to 5 inches long by 1 to 1½ inches wide.

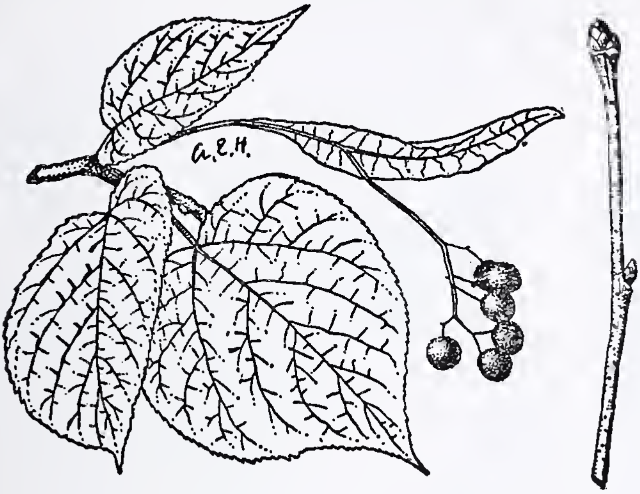
The very small FLOWERS are in clusters appearing when the leaves are about fully grown in April or May. Each has floral parts in 5's.

The FRUIT is round, about one-third inch in diameter, black, with a thin sweet flesh enclosing the 2 to 4 firm or hard seeds. They ripen in September and often remain on the stem for several months.

The WOOD is light brown, with lighter-colored sapwood consisting of about 5 years' growth. It is rather weak, light in weight and close-grained.

BASSWOOD, OR LINDEN *(Tilia* species)

The lindens, basswoods or lins, are a group of forest trees distinctive, yet as a group so similar that they are being considered together. They grow chiefly in the mountains of the eastern part of the State, attaining heights of 80 feet and diameters of 4 feet.



LINDEN, OR BASSWOOD

Leaf, one-third natural size

Twig, one-half natural size.

The BARK is light brown, deeply furrowed, and is often peeled for making rough camp buildings. The inner bark furnishes bast for making mats.

The LEAVES are more or less heart-shaped, 3 to 6 inches long, thin, saw-toothed, smooth on both sides in some species, but wooly on the under surface of others.

The FLOWERS are yellowish-white, in drooping clusters opening in early summer, and the flower-stem is united to the middle of a long, narrow, leaf-like bract. They are very fragrant and from them the bees make large amounts of choice-grade honey.

The FRUIT is a berry-like, dry, 1 to 2-seeded and rounded capsule, one-quarter to one-half an inch in diameter, covered with short, thick and brownish wool. It remains attached in clusters to the leafy bract, which later acts as a wing to bear it away on the wind.

The WOOD is light, soft, tough, not durable, light brown in color. It is used in the manufacture of pulp, woodenware, furniture, trunks, excelsior and many other articles.

The following species and varieties are reported for Oklahoma:

Tilia leucocarpa (or *nuda*) *glaucescens* (Sarg.) Sud.

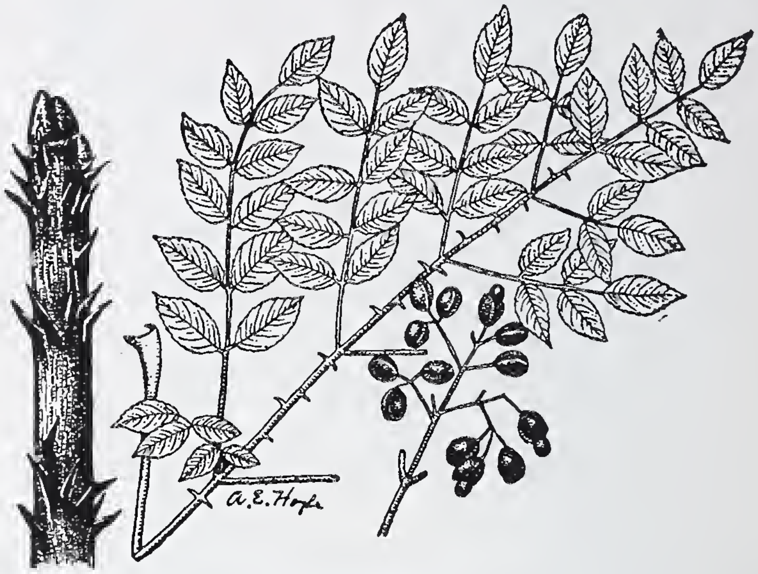
Tilia floridana (Small).

Tilia floridana hypoleuca (Sarg.).

HERCULES CLUB (TEAR-BLANKET)

(*Aralia spinosa* L.)

The hercules club or tear-blanket is also called the spikenard tree or the wait-a-bit. It is sometimes confused with the prickly ash. It grows in the moist soil of deep woods and though usually a shrub, sometimes becomes a tree, 30 to 40 feet high, with a trunk diameter of 6 to 8 inches. The trunk, branches and leaf-stalks are very prickly and the twigs are thick and stout with a large pith.



HERCULES CLUB

Leaf, one-seventh natural size. Twig, and Fruit, two-thirds natural size.

The BARK is a dark brown without, yellow within, about one-eighth inch thick, divided by shallow fissures into wide rounded ridges.

The LEAVES are twice compound, very large and clustered at the ends of the branches. They are 3 to 4 feet long and 2½ feet wide, but the ultimate leaflets are only 2 to 3 inches long and half as wide, dark green above and pale beneath. The petiole is about 1½ feet long, enlarged at the base and clasping the stem, with prickles on all parts of the leaf-rachis, or stem, and even on the midveins of the leaflets.

The FLOWERS appear in mid-summer. They are very small and form a cluster which is usually over 3 feet long.

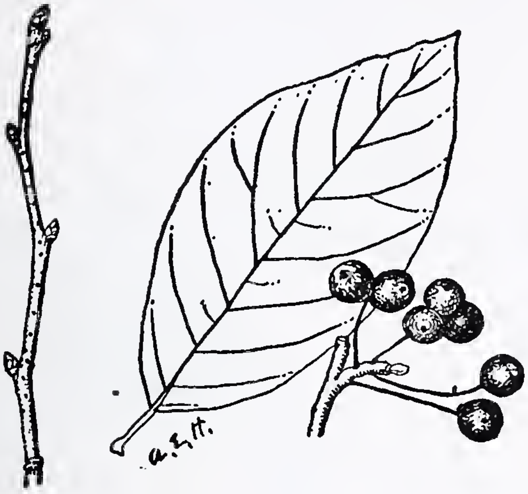
The black FRUIT is fleshy, round and slightly angled, one-sixth inch in diameter.

The WOOD is light, close-grained, brown streaked with yellow, with a layer of lighter sapwood of 2 to 3 rings.

This species is related to ginseng and the berries and the bark of the roots have medicinal use. It grows rapidly and is frequently cultivated for ornament.

BLACK GUM *(Nyssa sylvatica* Marsh.)

The black gum, often called sour gum, is found in the eastern part of the State. It is considered one of the weed trees of the forest and may be found in many types of soil and conditions of soil moisture. In the lowlands it is occasionally found in year-round swamps with cypress, and in the hills and mountains on dry slopes with oaks and hickories.



BLACK GUM
One-half natural size

The LEAVES are simple, 2 to 3 inches long, entire, often broader near the apex, shiny and dark green in color. In the fall the leaves turn a most brilliant red.

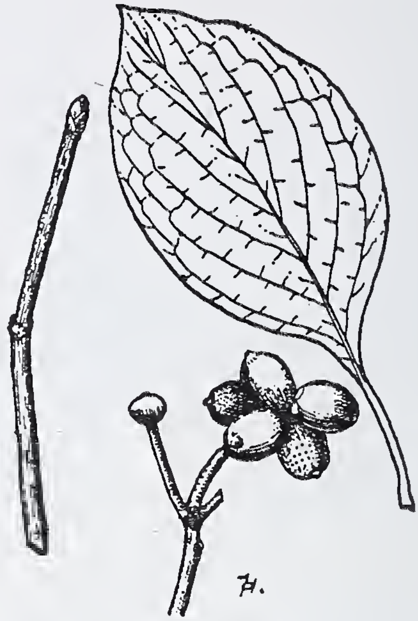
The BARK on younger trees is furrowed between flat ridges, and gradually develops into quadrangular blocks that are dense, hard and nearly black.

The greenish FLOWERS on long slender stems appear in early spring when the leaves are about one-third grown. They are usually of two kinds, the male in many-flowered heads and the female in two to several-flowered clusters on different trees. The FRUIT is a dark blue drupe, one-third to two-thirds of an inch long, containing a single hard-shelled seed, and is borne on long stems, 2 to 3 in a cluster.

The WOOD is very tough, cross-grained, not durable in contact with the soil, hard to work and warps easily. It is used for crate and basket veneers, box shooks, rollers, mallets, rough floors, mine trams, pulp-wood, railroad crossing planks and fuel. In the old days, the hollow trunks were used for "bee-gums."

DOGWOOD *(Cornus florida* L.)

The dogwood, often referred to as flowering dogwood, is found growing in the eastern half of the State, usually under the larger forest trees. It is a small tree, usually 15 to 30 feet high and 6 to 12 inches in diameter, occasionally larger, with a rather flat and spreading crown and short, often crooked trunk. The BARK is reddish-brown to black and broken up into small 4-sided scaly blocks.



DOGWOOD

Twig, two-thirds natural size. Leaf, one-half natural size.

The LEAVES are opposite, ovate, 3 to 5 inches long, 2 to 3 inches wide, pointed, entire or wavy on the margin, bright green above, pale green or grayish beneath.

The FLOWERS, which unfold from the conspicuous, round, grayish winter flower buds before the leaves come out, are small, greenish-yellow, arranged in dense heads surrounded by large white or rarely pinkish petal-like bracts, which give the appearance of large spreading flowers 2 to 4 inches across.

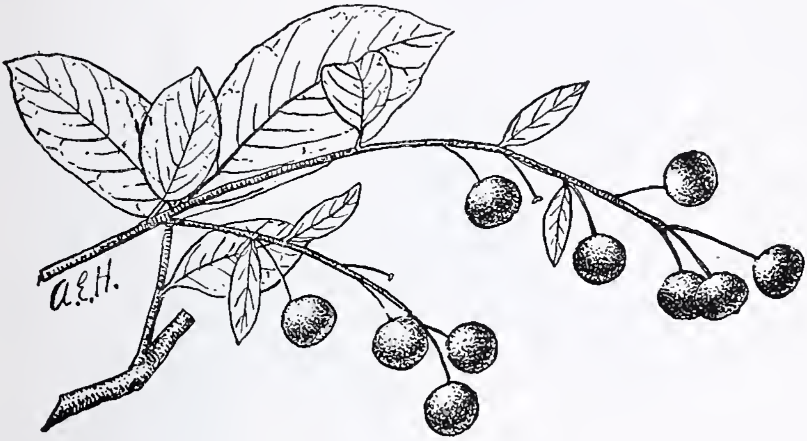
The FRUIT is a bright scarlet compound drupe, one-half an inch long and containing a hard nutlet in which are one or two seeds. Usually several fruits are contained in one head. They are relished by birds, squirrels and other animals.

The WOOD is hard, heavy, strong, very close-grained, brown to red in color. It is in great demand for cotton-mill machinery, turnery handles and forms. One other tree has quite similar wood, the persimmon.

The dogwood, with its masses of early spring flowers, its dark red autumn foliage and its bright red fruit is probably our most ornamental native tree. It should be used much more extensively in roadside and ornamental planting.

TREE HUCKLEBERRY (SPARKLEBERRY)
(*Vaccinium arboreum* Marsh.)

Through eastern Oklahoma this huckleberry tree grows in moist, sandy soil along the banks of ponds and streams. Although it is found from Virginia to Missouri and southward, it reaches its largest size near the Gulf Coast of Texas. The tree reaches a height of 20 to 30 feet. The crooked trunk may attain a diameter of 8 to 10 inches. Farther inland it is a large shrub.



TREE HUCKLEBERRY
Nearly natural size

The LEAVES are oval and glossy green, varying up to 2 inches in length and 1 inch in width. They are mostly evergreen or at least persist on the twigs during the winter.

The FLOWERS are small, white, bell-shaped and appear in long open clusters or racemes.

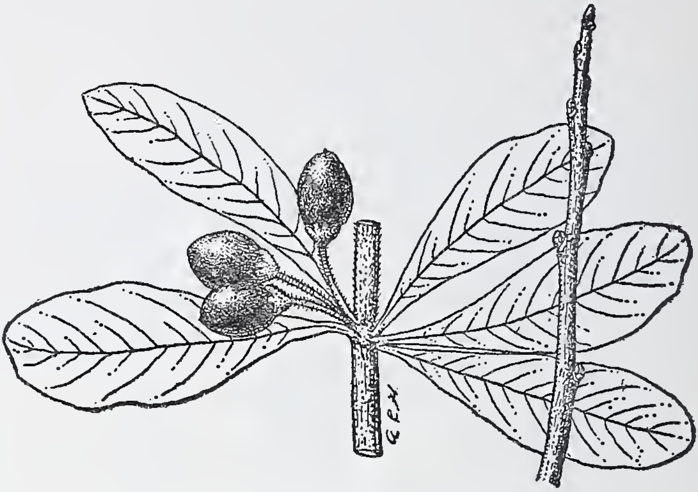
The small, round, shiny, nearly black berries, or FRUIT, ripen in the fall and unless eaten by birds or animals remain until spring. They have a slightly puckering but pleasant flavor.

The WOOD is heavy, hard, close-grained and light reddish-brown. It is sometimes used for tool handles.

CHITTAM WOOD

(*Bumelia lanuginosa* [Michx.] Persoon)

The chittam wood is also called wooly buckthorn or gum elastic and grows in sandy woods and thickets. It is found throughout the State. Though it becomes a medium-sized tree up to 30 feet high with a tall straight trunk over a foot in diameter, it is usually much smaller or even shrubby. Its branches are short, straight and stiff. The twigs are covered with thick brown wool at first, but become nearly smooth, reddish-brown to ashy gray.



CHITTAM WOOD
Three-quarters natural size

The BARK is up to one-half inch thick, gray on younger branches, becoming brownish-gray, broken up into narrow ridges of thick appressed scales.

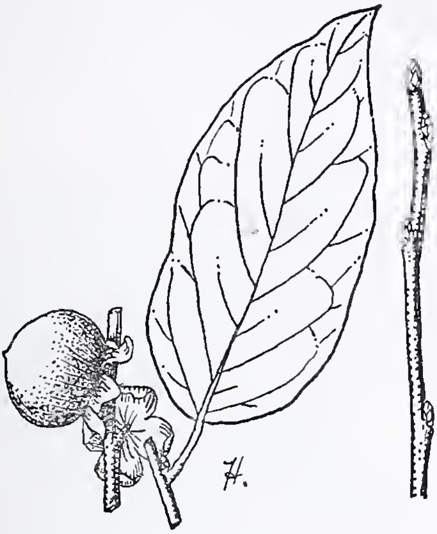
The LEAVES are 1½ to 2½ inches long, narrow, obovate, rounded at the apex and gradually narrowed toward the base. They are coated when they unfold with a rusty long tomentum, become smooth, dark green and lustrous above, remaining coated with long, sometimes silvery white, hairs below. The leaves are often clustered in short spurs, subtending clusters of the small flowers or fruits. The twigs may or may not be spiny.

The FLOWERS are small, perfect with 5 petals and 5 sepals (each set united into a cup), 5 stamens, and a single pistil which later forms a black fruit, one-half inch long, fleshy and drupe-like, or berry-like.

The WOOD is heavy but weak, close-grained, light brown streaked with white. The sapwood is yellowish. The chittam wood furnishes a clear viscid "gum elastic" from freshly cut stem wounds.

PERSIMMON (*Diospyros virginiana* L.)

The persimmon, often called "simmon," is well known throughout its range. It is a small tree, rarely exceeding 50 feet in height and 18 inches in diameter, occurring throughout the State. It seems to prefer dry, open situations, and is most abundant in old fields, though it occurs on rich bottomlands. The BARK of old trees is almost black and separated into thick nearly square blocks, much like the black gum.



PERSIMMON

Leaf, one-half natural size. Twig, three-quarters natural size.

The LEAVES are alternate, oval, entire, 4 to 6 inches long, dark green and shining above, paler beneath.

The small FLOWERS, which appear in May, are yellowish or cream-white, somewhat bell-shaped, the two kinds occurring on separate trees; the male in clusters of 2 to 3, the female solitary. They are visited by many insects.

The FRUIT is a pulpy, round, orange-colored or brown berry, an inch or more in diameter and containing several flattened, hard, smooth seeds. It is strongly astringent while green, but often quite sweet and delicious when thoroughly ripe. It is much relished by children, and by dogs, opossums and other animals.

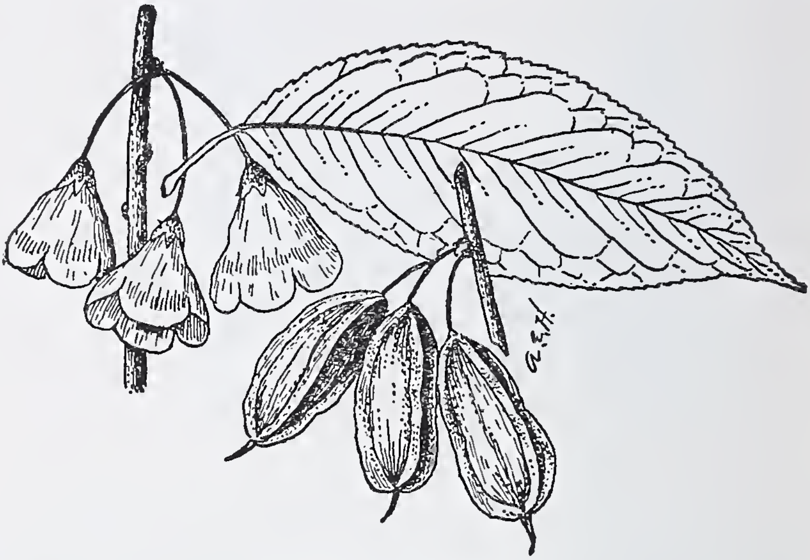
The WOOD is hard, dense, heavy, strong, the heartwood brown or black, the wide sapwood white or yellowish. It is particularly valued for shuttles, golf-stick heads, and similar special uses, but is not of sufficient commercial use to warrant its general encouragement as a timber tree.

Diospyros virginiana platycarpa Sarg., a variety having larger leaves with a more densely pubescent lower surface, is reported from northeastern Oklahoma.

MOUNTAIN SILVERBELL

(*Halesia monticola* Sarg.)

The mountain silverbell is probably so named because of its occurrence at high elevations of 3,000 to 4,000 feet in the Appalachian Mountains of North Carolina and Tennessee. In eastern Oklahoma, it reaches its westernmost home. It grows to good size and has a graceful rounded top of many spreading branches.



MOUNTAIN SILVERBELL
Flowers and Fruit, natural size. Leaf, one-half natural size.

The LEAVES are elliptical to oblong in shape, pointed, slightly or shallowly toothed, thin, dull green above and paler below, smooth, 6 to 10 inches long by 2 inches wide. In the autumn they turn yellow and fall.

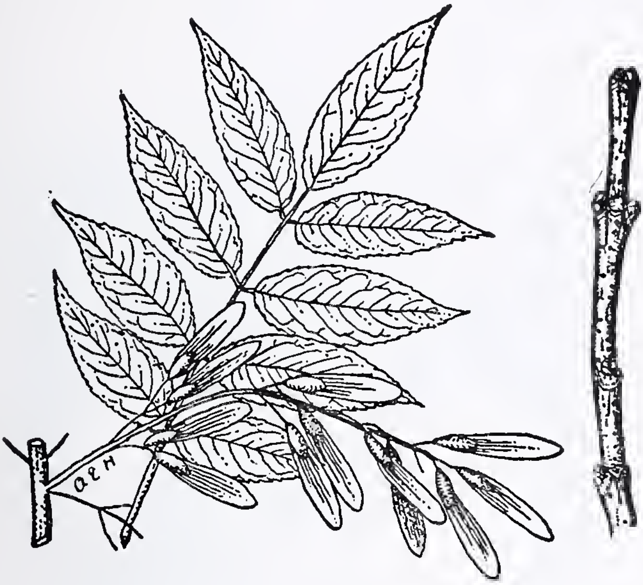
The bell-shaped FLOWERS are about 2 inches long or much larger than those of the sister species of silverbell which is abundant in the South, east of the Mississippi River. They are borne on flower stems (pedicels) an inch long, singly or in small clusters along the younger branchlets. The corolla, or flower bell, is 4-lobed, about an inch wide, and opens in early spring.

The FRUIT is 4-winged, oblong, 2 inches long and has from 1 to 4 cells, each containing a single hard seed. The seed is tough, light green, turning to reddish-brown, shiny and ripens in the autumn.

The WOOD is light, soft, close-grained and light brown in color.

WHITE ASH *(Fraxinus americana* L.)

The white ash is found in the eastern part of the State, but grows to best advantage in the rich moist soils of the mountains and river bottomlands. The BARK varies in color from a light gray to a dark brown. The rather narrow ridges are separated with marked regularity by deep, diamond-shaped fissures.



WHITE ASH

Leaf, one-third natural size. Twig, one-half natural size.

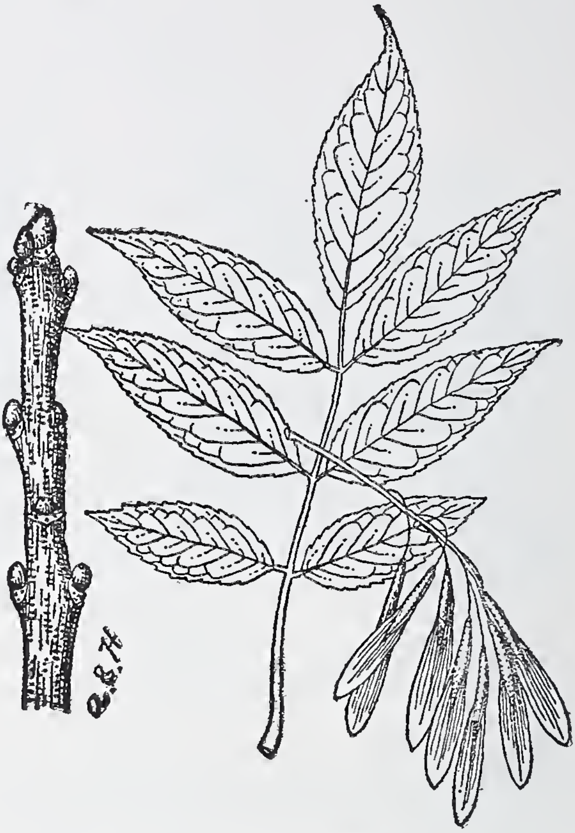
The LEAVES of the white ash are from 8 to 12 inches long and have from 5 to 9 plainly stalked, sharp-pointed leaflets, dark green and smooth above, pale green beneath. The ashes form the only group of trees in eastern America that have opposite, compound leaves with more than 5 leaflets. This fact in itself provides a ready means of identifying the group. The FLOWERS are of two kinds on different trees, the male in dense reddish-purple clusters and the female in more open bunches. The FRUIT of the ash is winged, 1 to 1½ inches long, resembling the blade of a canoe paddle in outline, with the seed at the handle end. The fruits mature in later summer and are distributed effectively by the winds.

The WOOD of the white ash is extremely valuable on account of its toughness and elasticity. It is preferred to all other native woods for small tool handles, such athletic implements as rackets, bats and oars, and agricultural implements. It is also used extensively for furniture and interior finish.

GREEN ASH (River Ash)

(*Fraxinus pennsylvanica lanceolata* [Bork.] Sarg.)

The green ash is a common tree, most abundant in valleys along streams. The hairy form of this tree is known as the red ash. It is found throughout the State as far west as Comanche County and attains a height of 50 feet or more, has spreading branches and a trunk ranging up to 2 feet in diameter. The twigs are smooth, round and ashy-gray, marked by pale lenticels and rusty bud-scales.



GREEN ASH
Fruit, two-thirds natural size. Leaf, one-third natural size.
Twig, three-quarters natural size.

The BARK is a half inch thick or more, brown, tinged with red and slightly furrowed or ridged. The LEAVES are attached opposite on the stem, compound, 10 to 12 inches long, 7 to 9 stalked leaflets which are pointed and slightly toothed on the margin. This species differs from the white ash in having the leaves bright green or yellow-green on both sides.

The FLOWERS are small, the male and female flowers occuring on different trees.

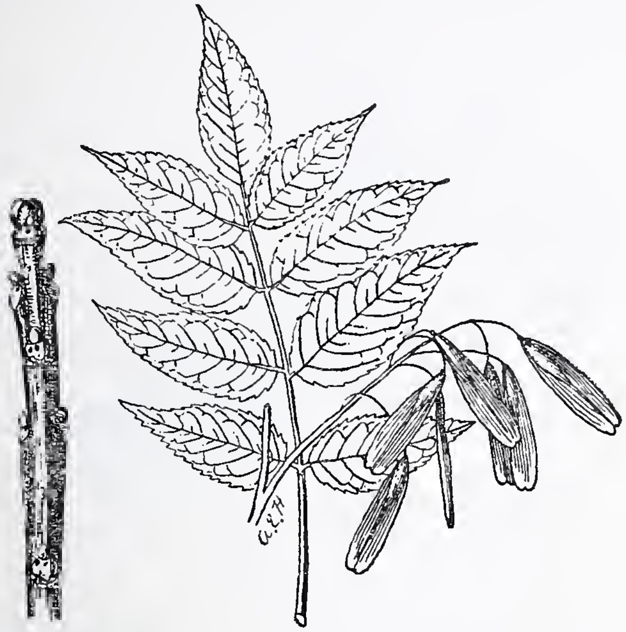
The FRUIT is flat and winged, 1 to 2½ inches long and one-quarter to one-third inch wide, with the wing portion extending well down past the middle of the seed-bearing part, and with the wing sometimes square or slightly notched at the outer end.

The WOOD is heavy, hard, rather strong, brittle and coarse-grained, light brown, with a rather broad layer of light sapwood. It is valuable and used for the same purposes, though not as desirable, as the white ash.

BLUE ASH

(*Fraxinus quadrangulata* Michx.)

The blue ash is not very common, but is found in the upland portions of the northeastern part of the State, where it is limited to limestone bluffs, occasionally descending to the adjacent bottomlands. It becomes a large tree 60 feet or more in height with a trunk 2 feet in diameter. The young twigs afford the most characteristic feature of this species as they are usually square, sometimes winged or 4-ridged between the leaf bases.



BLUE ASH

Leaf, one-third natural size. Fruit and Twig, two-thirds natural size.

The BARK is light gray tinged with red, one-half to two-thirds inch thick, irregularly divided into large plate-like scales. Macerating the inner bark in water yields a blue dye.

The LEAVES are opposite, compound, 8 to 12 inches long, having 7 to 11 stalked leaflets, long pointed and coarsely toothed. The leaves are thick and firm, smooth and yellowish-green above, paler beneath.

The FLOWERS are without petals and appear in clusters when the buds begin to expand.

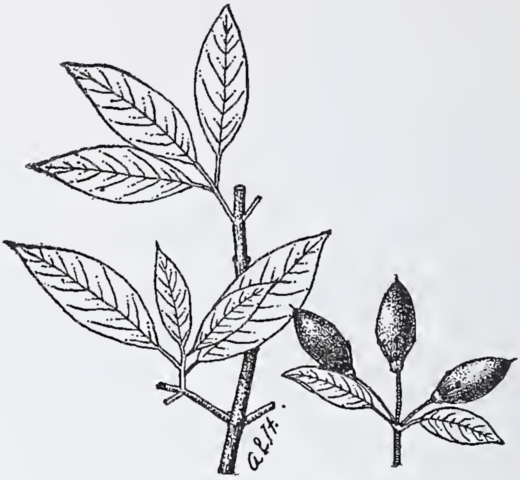
The FRUIT is flattened and oblong, 1 to 2 inches long and less than a half inch wide and usually notched at the outer end. The wing is about twice the length of the seed-bearing portion and extends down the sides past the middle.

The WOOD is heavy, hard and close-grained, light yellow, streaked with brown, with a very broad zone of lighter sapwood. It is used for flooring and wagon making, and is not usually distinguished commercially from the wood of other ashes.

SWAMP PRIVET

(*Forestiera acuminata* Michx.)

The forestiera or swamp privet is found along river banks along lakes and standing water in the low land sections of eastern Oklahoma. It is usually a large shrub, but often becomes a small tree, less than 30 or 40 feet high, with a short trunk usually less than 8 inches in diameter. Its youngest branches are slender, somewhat hairy, slightly angular and vary in color from yellowish-green to brown. They become darker and more rounded the second season.



SWAMP PRIVET
Two-thirds natural size

The BARK is thin, dark brown to brownish-gray, close and slightly ridged.

The LEAVES are opposite, 2½ to 4 inches long, 1 to 1½ inches wide, petioled and long pointed at both ends, yellowish-green on the upper surface, paler on the lower and slightly toothed above the middle.

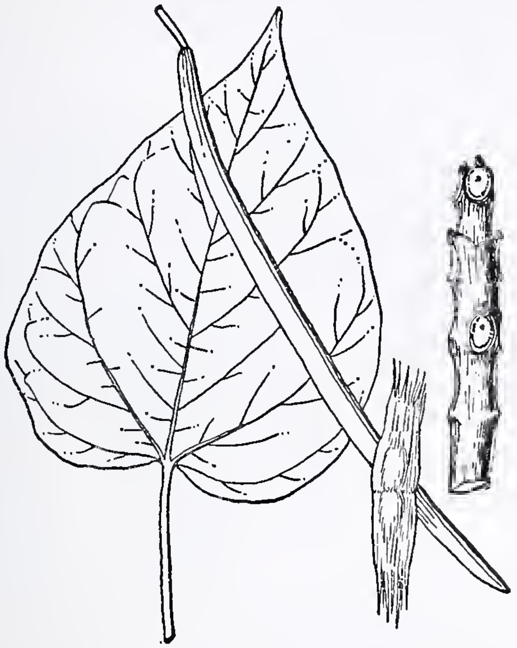
The FLOWERS appear in April before the leaves. They are of two kinds, borne separately on the same tree, rather small and in clusters.

The FRUIT falls as soon as ripe in May or June. It is oblong in shape, covered with a tough dry pulp, slightly curved when young (about an inch long and one-quarter inch wide), and tipped with a point. It is deep purple and contains a one-seeded stone.

The WOOD is close-grained, yellowish-brown, weak and rather soft. It has no economic use.

CATALPA (*Catalpa speciosa* Warder.)

This tree, often miscalled "catawba," is native to the central Mississippi River basin, but has been widely planted and has spread somewhat farther as a result of cultivation. It is found sparsely throughout the State, except in the mountains, and occurs on various qualities of soil, but most frequently on rich, moist soil, such as bottoms. It is a medium-sized tree, usually not exceeding 40 to 50 feet in height and 12 to 15 inches in diameter. The trunk is usually short and the head broad with spreading branches. The BARK varies from dark gray to brown, slightly rough, being divided into narrow strips or flakes. Because of its attractive flowers and conspicuous heart-shaped leaves, it is considerably used for shade and ornament.



CATALPA

Leaf, one-third natural size. Twig, two-thirds natural size.

The LEAVES are simple, opposite, oval, long pointed, 6 to 10 inches long, and heart-shaped at the base. The Catalpa Sphinx moth is a pest and sometimes defoliates the tree.

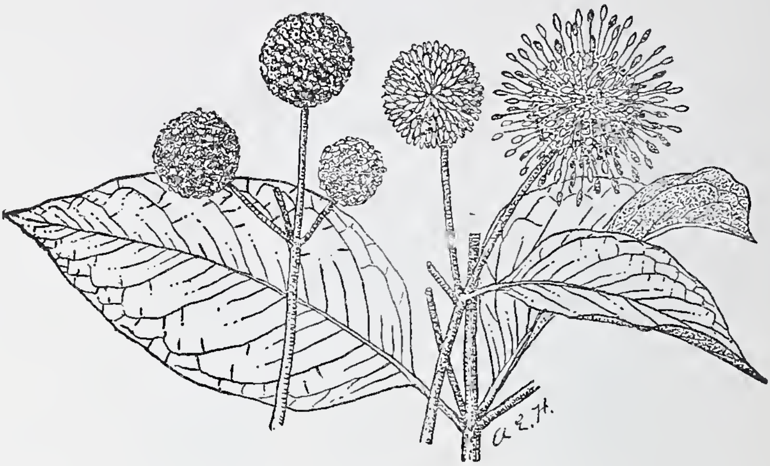
The FLOWERS appear in clusters or panicles in May or June. They are white with purple and yellow markings, and this makes them decidedly showy and attractive. The FRUIT consists of a bean-like capsule, 8 to 16 inches long and from three-fourths to one-half inch in diameter. It hangs on the tree over winter and gradually splits into two parts or valves. The seeds are about 1 inch long and terminate in wings that are rounded and short-fringed at the ends. They are freely carried by the wind.

The WOOD is rather soft, light, coarse-grained, and durable in contact with the soil. It is used for fence posts, poles and fuel and occasionally for railroad ties. It is a mistake to attempt to grow catalpa for fence posts or other uses except on good agricultural soil.

BUTTON BUSH

(Cephalanthus occidentalis L.)

The button bush is a small tree or large shrub, usually less than 50 feet high, with a straight tapering trunk up to a foot in diameter. The branches are generally upright and the branchlets spreading and pithy in the centers. They often occur in whorls of three from one place on the stem. The tree grows along the low wet borders of ponds and streams throughout Oklahoma. Its range is wide over southern United States and in Cuba and Mexico.



BUTTON BUSH

Leaf, one-third natural size. Fruit, two-thirds natural size.

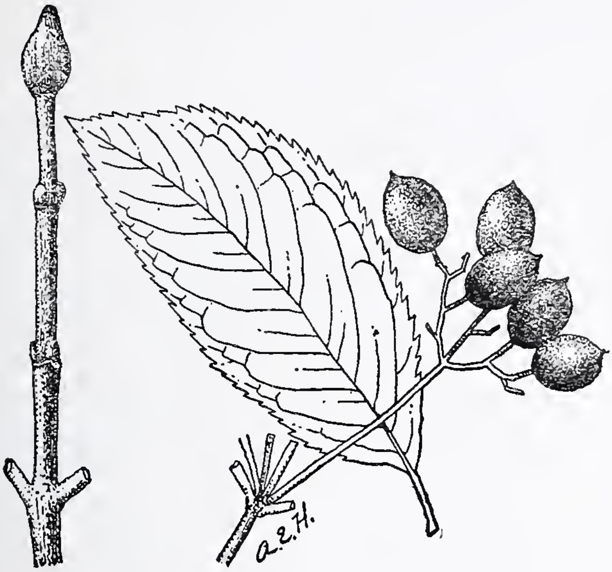
The LEAVES occur in pairs or in whorls of 3 (occasionally more), each oval or elliptical, pointed and rounded at the base, from 2 to 7 inches long by 1 to 3 inches wide. They are dark green on the upper side, thin with a large central midrib, yellow, yellowish and covered below with long white hairs. Some fall in the autumn, others remain on the branchlets over winter.

The FLOWERS form a creamy-white or yellow, round head about an inch in diameter, borne in clusters or panicles. The heads are made of many very small flowers, each fragrant and nectar-bearing. The long thread-like projections (styles) very conspicuous over the flowering heads, are the outer portions of the seed-bearing or female portions of the flower. The FRUIT is a compound ball, or mass, three-fourths inch across, dark brown when ripe and hard in texture, containing two elongated seeds from each separate flower. The WOOD is said to be heavy, hard and close-grained of a yellow or yellowish-brown color.

BLACK HAW

(*Viburnum rufidulum* Raf.)

The black haw is found on hillsides and along the margins of bottomlands in woods and thickets in eastern and southwestern Oklahoma. It forms a tree sometimes 35 feet high with a trunk over a foot in diameter, but is usually smaller, often flowering as a shrub. The twigs are ashy-gray, becoming dark dull reddish-brown after one to several years. The winter buds are densely covered with rusty brown hairs which persist for some weeks at the base of the leaf-stalks.



BLACK HAW
Three-quarters natural size

The BARK is one-quarter to one-half inch thick becoming roughened into small plate-like dark brown scales tinged with red. The bark has medicinal use.

The LEAVES are attached opposite each other on the stem, elliptic to obovate or oval, pointed or blunt at the apex, wedge-shaped or rounded at the base, and with fine teeth on the margin. They are leathery in texture, very shining and dark green above, pale and dull below, about 3 inches long and 1 to 1½ inches wide.

The FLOWERS are small and white, and each has five petals and five stamens, appearing in the spring, in dense clusters at the tips of branches.

The FRUIT is also clustered, and ripens in October. It is a bright blue oval drupe over one-half inch long, covered with a glaucous bloom, and containing a stony seed one-half inch long and one-third inch wide.

The WOOD is bad smelling and has no economic use. The tree is occasionally cultivated and is desirable for decorative planting.

TREES FOUND IN OKLAHOMA FOR WHICH ONLY A BRIEF DESCRIPTION IS GIVEN

1. *Juniperus monosperma* (Engel.) Sarg., the ONE-SEEDED JUNIPER or CEDAR, seldom attains a height of over 15 feet in this State. The fruit is dark blue or light chestnut-brown with one or rarely two seeds. It is found on the rough, broken country of western Cimarron County, particularly on summits and north slopes of mesas.

2. *Populus sargentii*, Dode., one of our common COTTONWOODS, has leaves somewhat smaller, on an average, than the species more fully described. Probably more common in western than in eastern Oklahoma.

3. *Populus alba*, L., the SILVER POPLAR or WHITE POPLAR, is an introduced species quite commonly planted for ornamental purposes. The silvery under surface of its leaves makes it very attractive and gives it its name. Its main disadvantages are a tendency to send up numerous root shoots and a relatively short life.

4. *Salix amygdaloïdes*, Anderson, the PEACH WILLOW or ALMOND WILLOW, with leaves resembling those of the peach tree, is reported to date only from the western part of the State, where it does not attain a very large size.

5. *Salix longipes venulosa*, Schu., a WILLOW having long, narrow leaves and foliaceous stipules on vigorous shoots, is reported to date only for western Oklahoma.

6. *Salix longipes wardii* (Bebb.), Schu., a WILLOW having lanceolate or narrow elliptic-lanceolate leaves, usually glabrous branchlets and obtuse stipules reported to date only from eastern Oklahoma.

7. *Salix longifolia*, Muehl., the SAND BAR WILLOW, with linear-lanceolate leaves often falcate and gradually narrowed at the ends, is reported for western Oklahoma.

8. *Salix missouriensis*, Bebb., a WILLOW with lanceolate, acuminate leaves, long-pointed at the apex, gradually narrowed from above the middle to the rounded base. Stipules foliaceous. Reported from eastern and southern Oklahoma.

9. *Myrica cerifera*, L., the WAX MYRTLE, has leaves 1½ to 4 inches long and one-fourth to one-half inch wide covered above by dark glands and below by bright orange-colored glands, gradually deciduous at the end of the first year. Found in southeastern Oklahoma usually only as a shrub. Usually found in low places or along streams.

10. *Juglans rupestris*, Engel., the LITTLE WALNUT or WESTERN WALNUT. has narrower leaflets than the black walnut and a smaller fruit, one-half to three-quarters inch in diameter, with a thin husk. It is found throughout western Oklahoma and in some portions of the central part of the State.

11. *Hicoria ovalis obovalis* (Sarg.), Sud., a HICKORY with fruit more or less obovoid, about 1 inch long and four-fifths inch in diameter, with a husk one-twelfth to one-eighth inch thick, splitting freely at the base, is reported from eastern Oklahoma.

12. *Hicoria villosa* (Sarg.), Ashe, a HICKORY with fruit ovoid, rounded at base, pointed at apex, only slightly angled, faintly tinged with red, with a shell rarely more than one-half inch in thickness, splitting tardily to the base by 1 or 2 sutures or indehiscent. Seed small and sweet.

13. *Castanea floridina margaretta*, a CHINQUAPIN found in southeastern Oklahoma, has burrs not, or rarely, densely set with spines. The spines are short and much forked. The sun leaves are lanceolate; glabrate or glabrous; thick acuminate or acute; never terminating in an awn.

14. *Quercus cinera,* Michx., the BLUE-JACK or UPLAND WILLOW OAK, with leaves oblong-lanceolate to oblong-obovate, gradually narrowed or cuneate or sometimes rounded at the base, acute or rounded and apiculate at the apex. Entire with thickened undulate margins. Reported for southeastern part of the State. Not a common tree.

15. *Quercus virginiana*, Mill., the LIVE OAK has leaves oblong, elliptic or obovate, rounded or acute at apex, usually gradually narrowed at the base, usually entire with slightly revolute margins, or rarely spinose-dentate above the middle, thin, dark green and lustrous on the upper surface, pale and pubescent on the lower surface, 2 to 5 inches long and one-half to 2½ inches wide. The acorns are ellipsoidal, narrowed at base, rounded or acute at apex, dark chestnut brown and lustrous, about one inch long and one-third inch thick, enclosed for about one-fourth their length in a light reddish-brown cup. Found on slopes of Wichita Mountains in Kiowa and Greer counties and possibly in Comanche County.

16. *Quercus prinoides*, Willd., the DWARF CHINQUAPIN OAK has leaves much resembling the true chinquapin oak, but is only shrubby in form.

17. *Quercus undulata*, Torrey., the ROCKY MOUNTAIN SHIN OAK, with leaves 1 to 1½ inches long and one-half to three-quarters inch wide undulately lobed with small acute lobes pointing forward. Deciduous late in winter or early spring. Occurs usually in shrubby form. Found in western and south-central Oklahoma.

18. *Ulmus parvifolia,* a so-called CHINESE ELM with smaller glossy leaves than *Ulmus pumila* is sometimes planted for shade tree purposes. It is a slower grower than the larger leaved species.

19. *Celtis reticulata*, Torrey., a HACKBERRY with broadly ovate leaves dark green and rough, or rarely smooth on upper surface, 1¾ to 3 inches long and three-quarters to 1½ inches wide, having stout petioles one-eighth to one-fourth inch long. Fruit orange-red or yellow, lustrous, one-fourth inch in diameter. Reported from eastern Oklahoma.

20. *Celtis reticulata vestita,* Sarg., a HACKBERRY similar to the one described above, but having more pubescent leaves, those on vigorous shoots being mostly cordate at base and covered above with short white hairs. Reported from northwestern Oklahoma.

21. *Celtis douglasii,* Plans., a HACKBERRY resembling *Celtis reticulata,* found in the western part of Cimarron County.

22. *Celtis pumila georgiana* (Small.) Sarg., a HACKBERRY with leaves ovate, acute, obliquely rounded at base, entire or sharply serrate, thin, dark green on upper surface, pale below. Fruit reddish-purple, one-half inch in diameter.

23. *Morus nigra,* L., the BLACK MULBERRY, a native of Persia and now naturalized and planted as an ornamental tree in the southern and central eastern states.

24. *Magnolia tripetala,* L., the UMBRELLA TREE has been found in small numbers north of Smithville in McCurtain County. Its name comes from the clusters of very large leaves surrounding the ends of the branchlets, remotely resembling an umbrella. The leaves vary from 14 to 22 inches long by 8 to 10 inches wide and are borne on stout stems. The flowers are creamy-white and ill-scented. The fruit is rose colored when ripe.

25. *Morus alba tatarica,* Land., the RUSSIAN MULBERRY, with most of its leaves more or less lobed and with red fruit, is an introduced species that has been extensively planted, particularly in the central and western parts of the State for windbreaks and hedges.

26. *Malus ioensis palmeri,* Rehd., the CRAB APPLE or WESTERN CRAB APPLE, has fruit three-fourths to 1½ inches thick and three-fourths to 1¼ inches long, green or greenish-yellow in color, often used in making jelly. It is found in eastern Oklahoma.

27. *Crataegus viridus,* L., a HAW or HAWTHORN with ovate to oval leaves, usually acute or acuminate at the apex, gradually rounded at the base, finely serrate above with incurved glandular teeth, and sometimes slightly 3-lobed toward the apex. Fruit bright scarlet or orange, one-eighth to one-fourth inch in diameter, on long, slender pedicels, mostly persistent through the winter. Found in eastern Oklahoma.

28. *Crataegus apiifolia* (Marsh.) Michx., the PARSLEY HAW has broad-ovate leaves, acute at the apex and pinnately 5-7 cleft with shallow acute or deep wide sinuses. Fruit bright scarlet, one-third inch long, short-oblong, calyx prominent. Found in eastern part of State.

29. *Prunus americana,* Marsh., a WILD PLUM, has oval to slightly obovate leaves, acuminate at apex and narrowed at base. Fruit less than 1 inch in diameter, orange with red cheek and becoming bright red when fully ripe, destitute of bloom. Found in eastern Oklahoma.

30. *Prunus lanata* (Sud.) R. & R., a WILD PLUM with shorter and broader leaves than *P. americana.* Fruit deep crimson covered with glaucous bloom. Found in eastern Oklahoma.

31. *Prunus hortulana,* Bailey, a WILD PLUM with leaves oblong-obovate to oblong-oval, acuminate and contracted at the apex, cuneate or rounded at the narrow base, 4 to 6 inches long and 1 to 1½ inches wide. Fruit three-fourths to 1 inch in diameter, deep red or yellow lustrous skin. Reported for northeastern Oklahoma.

32. *Prunus munsoniana,* W. & H., a WILD PLUM with leaves elliptic to lanceolate, acute at apex, cuneate or rounded at base. Fruit subglobose to short-oblong, three-fourths inch long, bright red with slight bloom marked by pale dots or yellow blotches, rarely yellow. Found in eastern Oklahoma.

33. *Prunus mexicana,* S. Wat., the BIG TREE PLUM with leaves ovate or obovate, abruptly long-pointed and acuminate at apex, usually rounded and often glandular at the base. Fruit subglobose to short-oblong, dark purple-red with a slight glaucous bloom 1¼ to 1 1-3 inches long and 1 to 1¼ inches in diameter. Found scattered over much of Oklahoma.

34. *Prunus virginiana melanocarpa* (L.) Sarg., the CHOKE CHERRY with leaves oval to obovate and rarely lanceolate, abruptly short-pointed at apex, cuneate or rounded at base, often doubly serrate. Fruit globose, one-fourth to one-third inch in diameter, lustrous, becoming dark vinous red or nearly black when ripe.

35. *Sophora affinis,* T. & G., the CORAL BEAN is one of the legumes and is usually found in this State in shrubby form. The leaves are compound, with 13 to 19 leaflets. The flowers appear with the leaves and are white tinged with rose color. The fruit is one-half to 3 inches long, black, more or less pubescecnt, 4 to 8-seeded or rarely 1-seeded. Cotyledons surrounded by a thin layer of horny albumen, bright green in color.

36. *Cotinus americana,* Nutt., or CHITTAM WOOD, has leaves oval or obovate, usually rounded at apex, gradually contracted at base, entire with wavy revolute margins. Wood light, soft, bright clear rich orange color with thin white sapwood. Durable in contact with soil. Reported for northeastern Oklahoma.

37. *Rhus copallina,* L., WINGED SUMAC or SHINING SUMAC, is distinguished by the wings growing on either side of the rachis between the leaflets. It usually occurs as a medium-sized shrub growing in thickets scattered over most of Oklahoma.

38. *Rhus glabra,* L., the SMOOTH SUMAC has a compound leaf with the base of the petiole entirely surrounding the bud. The sap is milky. It is usually found as a medium-sized shrub in thickets scattered over most of Oklahoma.

39. *Ilex vomitoria,* Ait., the YAUPON, a small broad-leaved evergreen, is found usually as a shrub or small tree along water courses in

southeastern Oklahoma. The leaves are glisteny green. The fruit is about one-fourth inch in diameter, scarlet, globose and sometimes remains on the tree until spring.

40. *Acer leucoderme,* Small., a SUGAR MAPLE with leaves truncate or slightly cordate at the base, more or less deeply divided into 3-5 acute lobes, is found in southeastern Oklahoma. It does not commonly attain a size in excess of 12 inches in diameter and 20 to 25 feet high.

41. *Evonymus atropurpureus,* Jacq., the WAHOO, with opposite elliptic leaves, 1½ to 6 inches long and one-half to 1½ inches wide, maroon flowers, red fruit remaining until after the leaves have fallen, usually found as a shrub along banks above streams in the eastern half of the State.

42. *Staphylea trifolia,* L., the BLADDERNUT has trifoliolate leaves having oval serrate marginal leaflets and smooth bark longitudinally streaked with gray. The fruit is an inflated 3-celled pod ripening in the fall. It is found, usually on good soils, scattered over the eastern part of the State.

43. *Cornus asperifolia,* Michx., the ROUGHLEAF DOGWOOD or SMALL-FLOWERED DOGWOOD, is commonly found as a thicket of shrubs or small trees. It is much less conspicuous than its large flowered relative, but is much more widely distributed, being found throughout the State.

44. *Halesia parviflora,* Michx., the SILVER BELL has oblong-ovate leaves, 2½ to 3¼ inches long and 1 to 1¼ inches wide, finely serrate with minute glandular teeth. The fruit is clavate, gradually narrowed into a long stipitate base, 4-winged, stone ovoid. Found in eastern part of State.

45. *Chionanthus virginica,* L., the FRINGE-TREE, GRANDPA'S GRAY-BEARD or sometimes locally called WHITE ASH, has oblong, entire leaves, glabrous above and at maturity glabrous beneath except on the veins. The flowers are in slender drooping panicles, white, purple, spotted within at base. It occurs as a shrub or small tree in southern and eastern Oklahoma.

46. *Catalpa bignonioides,* Walter, the COMMON CATALPA has broad-ovate leaves, 8 to 14 inches long, cordate at base. Flowers are in panicles, white spotted with yellow and purple within. Seeds in long pods. Often more than 3 pods in a cluster.

47. *Paulownia tomentosa* (Thun.) Steud., the PRINCESS TREE is a close relative of the catalpa and much resembles it in general appearance. Its flowers, very fragrant and blue in color, are borne in upright clusters. The fruit-pods, suggestive of miniature bishop's miters, open in the fall and liberate the filmy winged seeds.

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TREES

I think that I shall never see
A poem lovely as a tree.

A tree whose hungry mouth is prest
Against the earth's sweet flowing breast,

A tree that looks at God all day
And lifts her leafy arms to pray,

A tree that may in summer wear
A nest of robins in her hair,

Upon whose bosom snow has lain,
Who intimately lives with rain.

Poems are made by fools like me,
But only God can make a tree.

JOYCE KILMER,
(Who gave his life in France)